TOYOTOMI

SERVICE MANUAL

ROOM AIR CONDITIONER

TAN/TAG-A20HW
TAN/TAG-A28HW
TAN/TAG-A32HW

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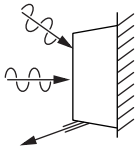
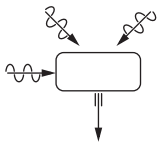
SPECIFICATION

TAN/TAG-A20EW

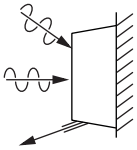
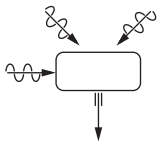
		Unit	INDOOR	OUTDOOR
			TAN-A20HW	TAG-A20HW
Cooling Capacity		BTU/h	7,700	–
Heating Capacity		BTU/h	8,800	–
Moisture Removal		L/h	1.4	–
Power source		phase	Single	
		V	230	
		Hz	50	
Airflow Method		OUTLET INTAKE	SIDE VIEW 	TOP VIEW 
Air circulation (at High)		m^3/min	Cooling ; 6.5 Heating ; 7.0	–
Electrical Data	Input	W	Cooling ; 750 Heating ; 710	–
	Running Current	A	Cooling ; 3.5 Heating ; 3.4	–
	Starting Current	A	18	–
Piping Connection Port (Flare piping)		inch	L ; Half Union 1/4' '	L ; 2-way valve 1/4' '
		inch	G ; Half Union 3/8' '	G ; 3-way valve 3/8' '
Pipe Size (Flare piping)		inch	L (liquid side) ; 1/4' '	L (liquid side) ; 1/4' '
		inch	G (gas side) ; 3/8' '	G (gas side) ; 3/8' '
Drain hose	Inner diameter	mm	14	–
	Length	m	0.7	–
Power Cord	Length	m	1.5	–
	Number of core-wire		core-wire/ 1 mm^2	–
Dimensions	Height	mm	265	490
	Width	mm	795	640
	Depth	mm	175	210
Net Weight		kg	7.2	24

SPECIFICATION

		Unit	INDOOR	OUTDOOR
			TAN-A20HW	TAG-A20HW
Air Circulation	Type		Cross-flow Fan	Propeller Fan
	Motor Type		Induction (4-pole)	Induction (6-pole)
	Rated Output	W	18	15
Heat Exchanger			Plate fin configuration,forced draft	
			18.1FPI	19.5 FPI
Refrigerant Control Device			–	Capillary Tube
Refrigerant (R410A)		g (oz)	–	700(24.7)
Thermostat			Electronic Control	–
Protection Device			–	OHR
Timer			Real time dual ON/OFF 7-hour OFF	–
Air Filter			Mold-proof	–
Parts Provided			1 Mounting plate 2 Remote controller 3 Battery (2 pcs.) 4 Remote controller holder 5 Screw cap (2 pcs.) 6 Drain elbow	

★ Specifications are subj ect to change without notice.

TAN/TAG-A28EW

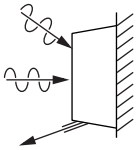
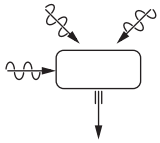
		Unit	INDOOR	OUTDOOR
			TAN-A28HW	TAG-A28HW
Cooling Capacity		BTU/h	9,000	–
Heating Capacity		BTU/h	10,500	–
Moisture Removal		L/h	1.6	–
Power source		phase	Single	
		V	230	
		Hz	50	
Airflow Method		OUTLET / INTAKE	SIDE VIEW 	TOP VIEW 
Air circulation (at High)		m^3/min	Cooling ; 7.0 Heating ; 8.0	–
Electrical Data	Input	W	Cooling ; 820 Heating ; 840	–
	Running Current	A	Cooling ; 3.6 Heating ; 3.7	–
	Starting Current	A	22	–
Piping Connection Port (Flare piping)		inch	L ; Half Union 1/4' '	L ; 2-way valve 1/4' '
		inch	G ; Half Union 3/8' '	G ; 3-way valve 3/8' '
Pipe Size (Flare piping)		inch	L (liquid side) ; 1/4' '	L (liquid side) ; 1/4' '
		inch	G (gas side) ; 3/8' '	G (gas side) ; 3/8' '
Drain hose	Inner diameter	mm	14	–
	Length	m	0.7	–
Power Cord	Length	m	1.5	–
	Number of core-wire		core-wire/ 1 mm^2	–
Dimensions	Height	mm	265	545
	Width	mm	795	710
	Depth	mm	175	255
Net Weight		kg	7.2	29

SPECIFICATION

		Unit	INDOOR	OUTDOOR
			TAN-A28HW	TAG-A28HW
Air Circulation	Type		Cross-flow Fan	Propeller Fan
	Motor Type		Induction (4-pole)	Induction (6-pole)
	Rated Output	W	18	20
Heat Exchanger			Plate fin configuration,forced draft	
			18.1FPI	19.5FPI
Refrigerant Control Device			–	Capillary Tube
Refrigerant (R410A)		g (oz)	–	830(29.3)
Thermostat			Electronic Control	–
Protection Device			–	OLR(INNER)
Timer			Real time dual ON/OFF 7-hour OFF	–
Air Filter			Mold-proof	–
Parts Provided			1 Mounting plate 2 Remote controller 3 Battery (2 pcs.) 4 Remote controller holder 5 Screw cap (2 pcs.) 6 Drain elbow	

★ Specifications are subj ect to change without notice.

TAN/TAG-A32EW

		Unit	INDOOR	OUTDOOR
			TAN-A32HW	TAG-A32HW
Cooling Capacity		BTU/h	11,500	–
Heating Capacity		BTU/h	13,500	–
Moisture Removal		L/h	2.1	–
Power source		phase	Single	
		V	230	
		Hz	50	
Airflow Method		OUTLET INTAKE	SIDE VIEW 	TOP VIEW 
Air circulation (at High)		m^3/min	Cooling ; 8.0 Heating ; 9.7	–
Electrical Data	Input	W	Cooling ; 1,050 Heating ; 1,010	–
	Running Current	A	Cooling ; 4.7 Heating ; 4.5	–
	Starting Current	A	27	–
Piping Connection Port (Flare piping)		inch	L ; Half Union 1/4' '	L ; 2-way valve 1/4' '
		inch	G ; Half Union 3/8' '	G ; 3-way valve 3/8' '
Pipe Size (Flare piping)		inch	L (liquid side) ; 1/4' '	L (liquid side) ; 1/4' '
		inch	G (gas side) ; 3/8' '	G (gas side) ; 3/8' '
Drain hose	Inner diameter	mm	14	–
	Length	m	0.7	–
Power Cord	Length	m	1.5	–
	Number of core-wire		core-wire/ 1 mm^2	–
Dimensions	Height	mm	265	545
	Width	mm	795	710
	Depth	mm	182	255
Net Weight		kg	8.3	33

		Unit	INDOOR	OUTDOOR
			TAN-A32HW	TAG-A32HW
Air Circulation	Type		Cross-flow Fan	Propeller Fan
	Motor Type		Induction (4-pole)	Induction (6-pole)
	Rated Output	W	22	20
Heat Exchanger			Plate fin configuration,forced draft 19.5FPI	19.5 FPI
Refrigerant Control Device			–	Capillary Tube
Refrigerant (R410A)		g (oz)	–	1,100(38.8)
Thermostat			Electronic Control	–
Protection Device			–	OLR(INNER)
Timer			Real time dual ON/OFF 7-hour OFF	–
Air Filter			Mold-proof	–
Parts Provided			1 Mounting plate 2 Remote controller 3 Battery (2 pcs.) 4 Remote controller holder 5 Screw cap (2 pcs.) 6 Drain elbow	

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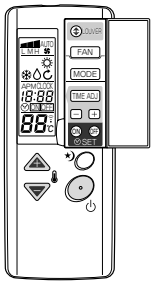
REMOTE-CONTROL TRANSMITTER



ON/OFF

Operation mode selection
AUTOMATIC
COOL
DRY
HEAT
CIRCULATER

Air flow selection
AUTOMATIC
HIGH
MEDIUM
LOW

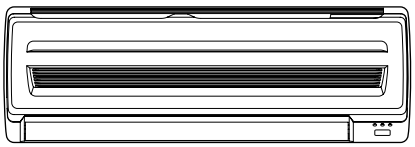
Room temperature setting
16℃ ～ 30℃

Timer operation selection
CONTINUOUS operation
OFF
ON
Sleep

Timer / time setting
Operation stops at the set time(OFF timer)
Operation starts at the set time(ON timer)
0.5 ～ 7.0hours(Sleep timer)

Air flow direction control
Auto angle selection
Auto swing mode
Manual mode

INDOOR UNIT



Sensing the room temperature
Room temperature sensor (thermistor)

Time delay safety control
Restarting is inhibited for approximately 3 minutes.

Indoor fan speed control
High, Med, Low

Operation indication lamps (LED)
(GREEN)..... Light up in operation
(YELLOW) .... Timer in operation
(GREEN)..... Outdoor unit operate

Dry operation mode
Intermittent operation of fan at low speed.

Room temperature control
Maintains the room temperature in accordance with the setting temperature.

Deice (defrost) control
Deicing operation automatically starts when the heating efficiency is declined by the ice formed in the outdoor unit.
After deicing operation, heating operation automatically starts with " Hot start function."

OUTDOOR UNIT

Hot-start control (heating)

The indoor fan stops until the evaporator piping temperature will be reached.

Overload protection

Anti-freezing control for the evaporator

Compressor will be stopped when the evapolator' s piping temperature is below 2℃ for one minute.
Compressor will be restarted when the evaporator' s piping temperature is above 2℃.

Airflow direction control

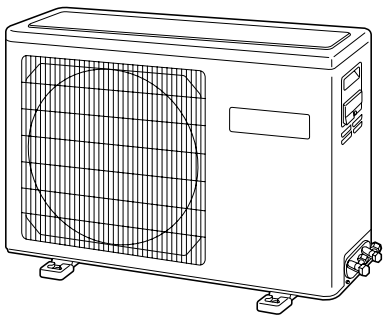
When ON/OFF BUTTON is pressed, the vertical louver will move to the adequate positions for each operation automatically.
Manual operation.
The louver starts vertical swing with a push of the LOUVER BUTTON. Push the LOUVER BUTTON once again to stop the louver at the desired position while swinging.

Auto recovery function

If there is any power failure during operation, operation status before power failure is memorized.
3 ～ 4 minutes after power recovery, the unit restarts automatically with previous operation status memorized.
(3 ～ 4 minutes is protective time for compressor.)

Attention

Because of Auto recovery function, if shutting off the power supply during operation, the unit may restart irrespective your intention when turning on the power supply next time.
If the unit is not to be used for a long time, shut off the power supply after terminating all operation with remote controller.



Compressor overload protector

When overheating of the compressor is detected,protector ★1 stops the operation of the compressor.
When high current supplied to the compressor is detected, the main controller stops the operaiton of outdoor unit including compressor

3 min. forced operation control

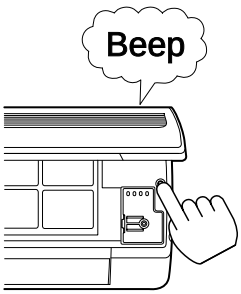
Once the compressor is activated, it does not stop for 3 minutes.
In case of termination of this operation, push the ON/OFF button on remote controller.

★1 OHR(Over Heat Relay) • • •TAN/TAG-A20GW
INNER PROTECTOR • • • TAN/TAG-A28GW, TAN/TAG-A32GW

EMERGENCY AND TEST OPERATION

Emergency Operation

- Use this operation only when the remote controller is out of order or lost.
- When the emergency operation switch is pressed, beep starts once, which means the start of this operation.
- In this operation, the system automatically selects the operation modes, cooling (or heating when available) according to the room temperature, as follows.



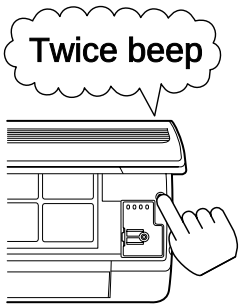
Temperature	Operation mode	Designated temperature	Timer mode	Air flow
ABOVE 23℃	COOLING	26℃	CONTINUOUS	AUTOMATIC
BELOW 23℃	HEATING	23℃	CONTINUOUS	AUTOMATIC

- It is not possible to operate in dry mode.

Test Operation

Test operation switch is same as emergency one.

- Use this operation only for testing the performance of the machine in the condition where the room temperature is less than 16℃.
- Continue to press the test operation switch for more than 5 seconds. After you hear twice beep, release your finger from the switch: the cooling operation starts with the air flow speed " HI."
- If the test operation switch is pressed more than 10 seconds, it doesn' t work.
- After 30 minutes, test operation ends automatically.



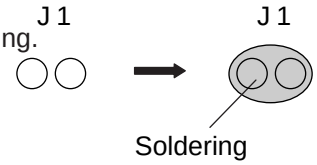
HOW TO RELEASE EMERGENCY AND TEST OPERATION

- In case of releasing during those operations, you can either push emergency operation switch once more or apply operation using remote control.
  You will hear a beep sound and emergency/ test operation is released.
- If you release the operation by remote control, operation will continue as setting of the remote control automatically.

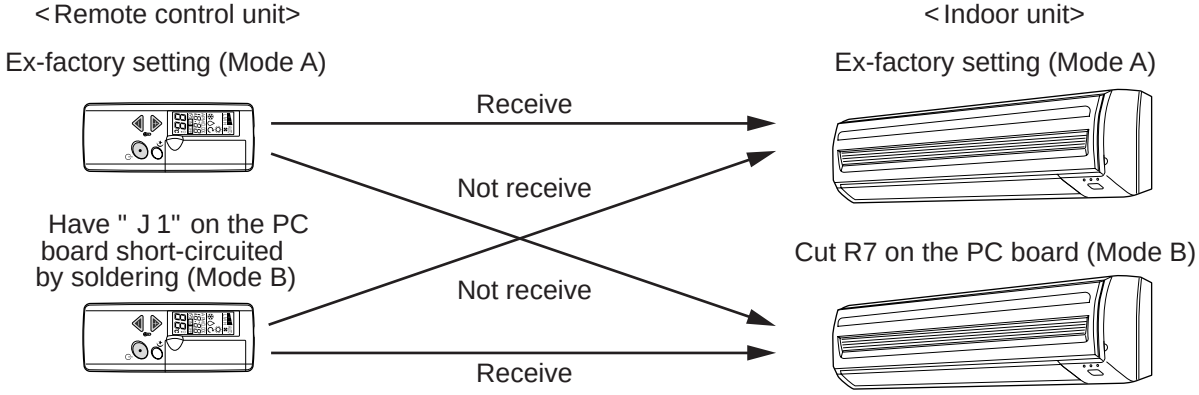
INTERFERENCE PREVENTION OF SIGNALS FROM THE REMOTE CONTROLLERS

When two indoor units used in the same room, interference of the signals may happen. To avoid this, alternative signal model B can be selected by the following. (Ex-factory setting is mode A)

- Remote controller side : Have " J 1" on the PC board short-circuited by soldering.
- Indoor unit side : Cut " R7" on the PC board.(7K, 9K, 12Kmodel)



(Each Operations Details)



TIMER OPERATION

ON Timer operation

- Press the ON/OFF switch.
- Set the “ ON Time” : Press the “ TIME ADJ ” button twice.
  Adj ust the time with the ▲ ▼ ” button.
  Press the “ TIME ADJ ” button twice.The setting of “ ON Time” is completed and the present time appears on the LCD.
- Set the “ ON Timer” : Press the Timer fixing button “ ON” .

OFF Timer operation

- Press the ON/OFF switch.
- Set the “ OFF Time” : Press the “ TIME ADJ ” button 3 times.
  Adj ust the time with the ▲ ▼ ” button.
  Press the “ TIME ADJ ” button once.The setting of “ OFF Time” is completed and the present time appears on the LCD.
- Set the “ OFF Timer” : Press the Timer fixing button “ OFF” .

Sleep Timer operation

- Press the “ SLEEP” button during the operation.
- Set the operating period by pressing the “ SLEEP” button until the period appears on the LCD.

Timer Cancellation

- ON/OFF Timer : Press the Timer fixing button “ ON” (On Timer) and/or “ OFF” (Off Timer) once again.
- Sleep Timer : Press the “ SLEEP” button until the operating period on the LCD disappears.

AIRFLOW DIRECTION CONTROL

Vertical adjustment

When ON/OFF switch is pressed, the vertical louver will move to the adequate positions for each operation automatically.

Swing of air flow

If air flow direction switch is pressed once, the vertical louver will move within the range of figures.

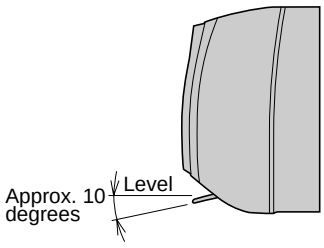
Fixing the flow direction

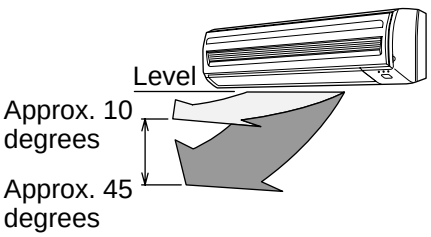
If air flow direction switch is pressed again, the vertical louver will be fixed and that position is memorized. From the next operation the louver will be set at previous position automatically.

Notes :

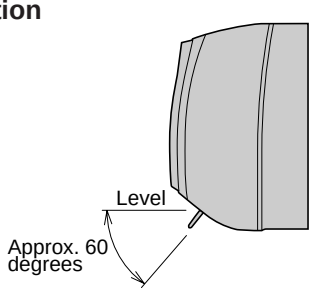
- In Swing Mode, the louver automatically moves up and down within the certain range, as the illustration below.
- There is two different ranges of louver swinging; one is of cooling & dry mode operation and the other is of heating operation.

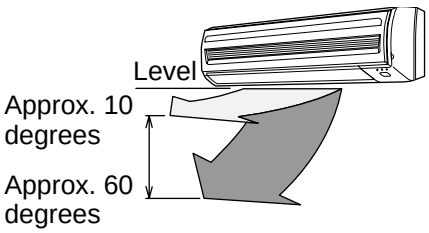
During Cooling, Dry Operation





During Heating Operation



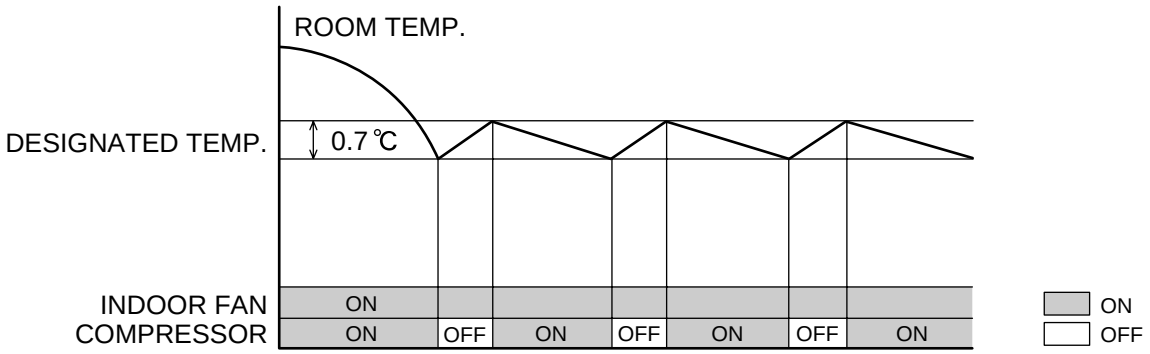


TIME DELAY SAFETY CONTROL FUNCTION - FOR PROTECTION OF COMPRESSOR

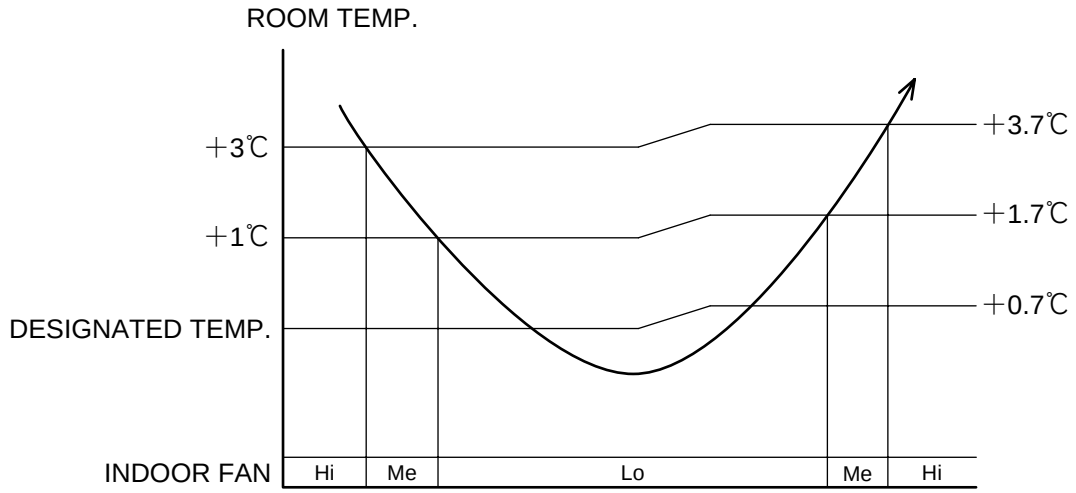
- Compressor will not restart, in any operation modes, for 3 minutes after its stop.
- Compressor does not stop during the first 3 minutes of its operation even if the room temperature reaches to the designated temperature, except changing setting temperature.

COOLING MODE OPERATION

- Compressor stops when the room temperature is cooled down to the designated temperature.
- Compressor restarts when room temperature is raised to + 0.7℃ higher than the designated temperature.

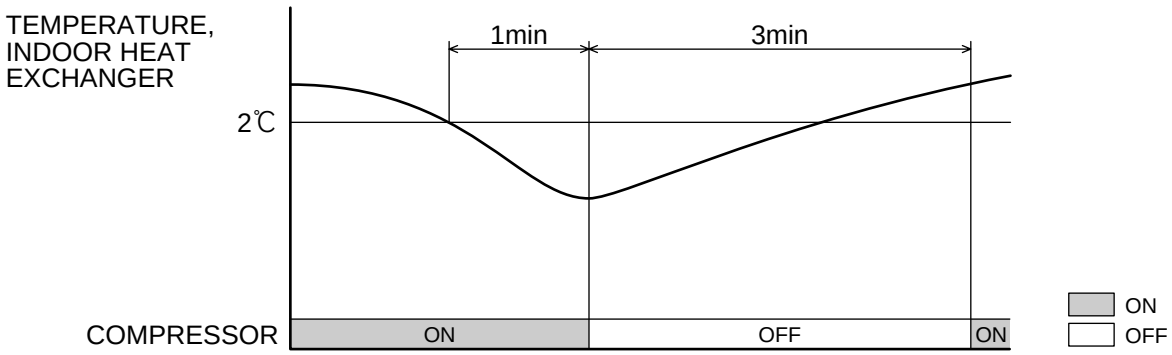


- Fan speed control when “ Auto” is selected in fan mode
  When “ Auto” is selected,the fan speed is automatically controlled according to the difference between the room and designated temperatures.



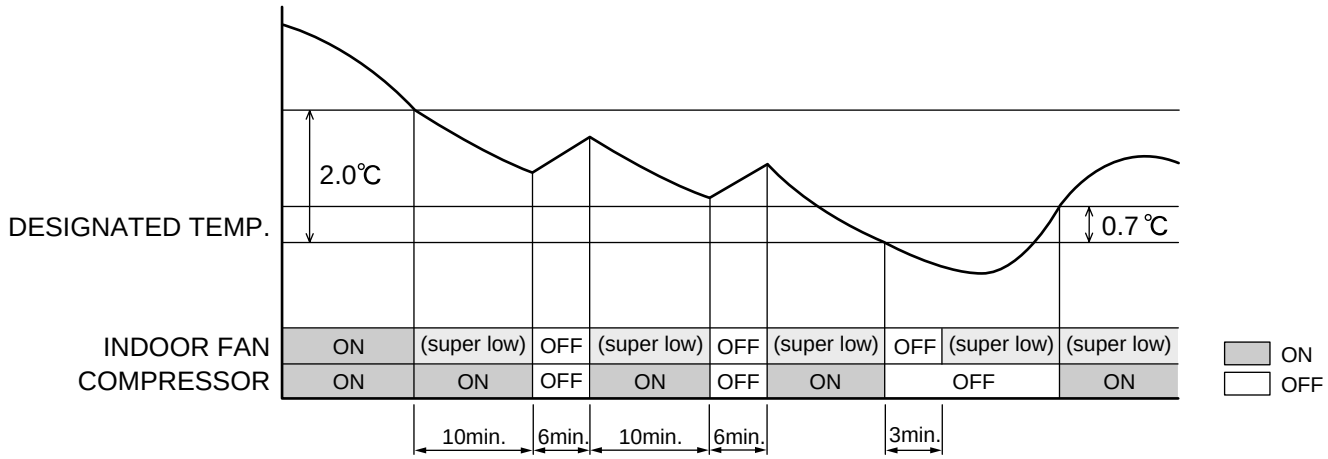
- Method of anti-freezing control of heat-exchanger(indoor)

When the sensor(heat-exchanger) detects the temperature below 2℃ for the duration of one minute,the compressor stops the operation.
After that,the compressor will automatically resume the operation
when the sensor(heat-exchanger) detects the temperature 2℃ and above.



DRY MODE OPERATION

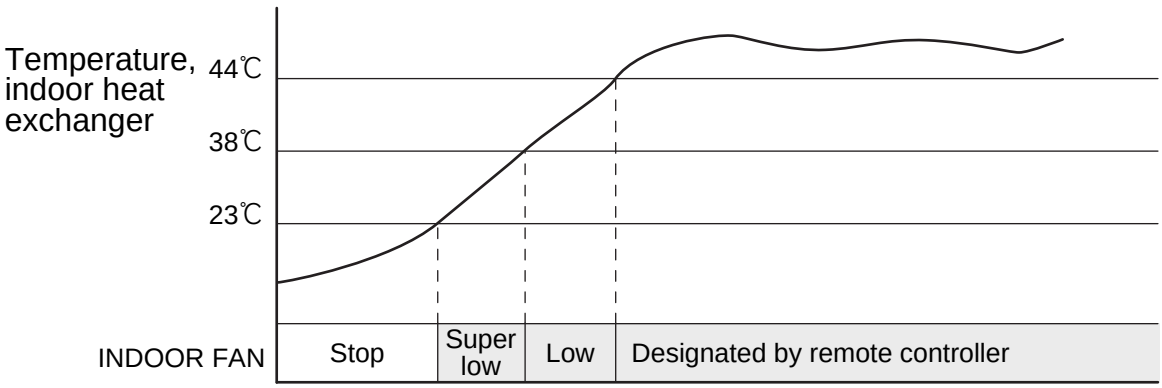
1. When the room temperature is +2℃ (or more) higher than designated temperature, compressor and indoor fan operate.
2. When the room temperature has been cooled to the temperature +2℃ higher than the designated, the compressor and indoor fan start intermittent operation, ON (for 10 min.) and OFF (for 6 min.) by turns. The air flow speed of indoor fan is super low.
3. When the room temperature is cooled to designated temperature, compressor and indoor fan stop. The indoor fan restarts at the air flow speed of super low, after 3 minutes the compressor stops.
4. When the room temperature is raised to +0.7℃ higher than the designated temperature, the intermittent operation above #2 starts.
5. When operating in #2 above, if the room temperature becomes +2.7℃ higher than the designated, the operation #1 above starts.

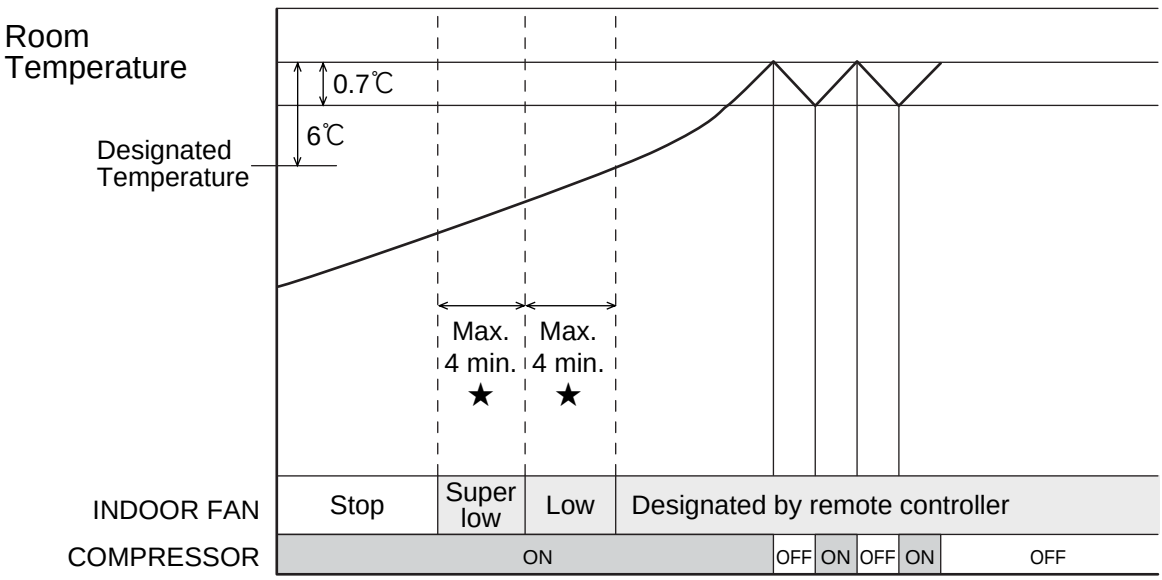


HEATING MODE OPERATION

- When room temperature is raised to +6°C higher than the designated temperature, compressor stops.
- When room temperature gets less than +5.3°C higher than the designated temperature, compressor turns on.
- At the start of heating operation, if the room temperature is less than +18°C, additional +1°C is set to the temperature designated by the remote controller. (Canceled when the compressor first stops.)
- Hot Start Function

  To prevent the unpleasant cold air to flow, the air flow speed is determined as shown below according to the temperature of the indoor heat exchanger.

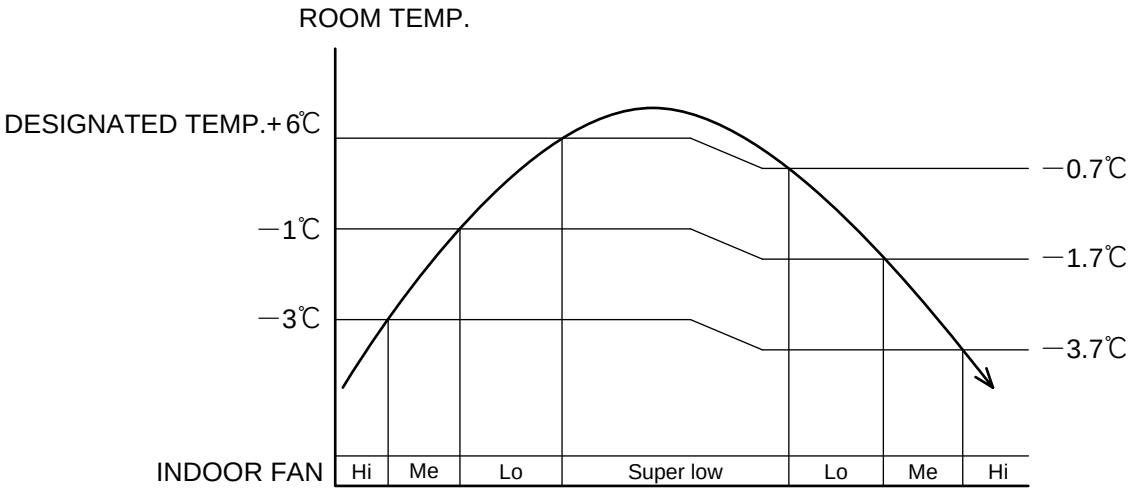




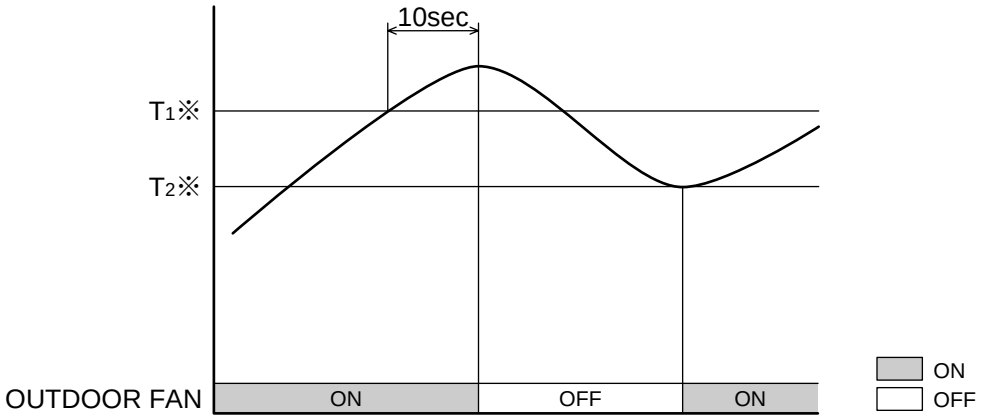
★ : In maximum 4 minutes,the operation proceed to the next steps when the heat exchanger is not warmed up to the reference temperature shown above.

ON
OFF

- Fan speed control when “ Auto” is selected in fan mode
  When “ Auto” is selected,the fan speed is automatically controlled according to the difference between the room and designated temp.+4℃.



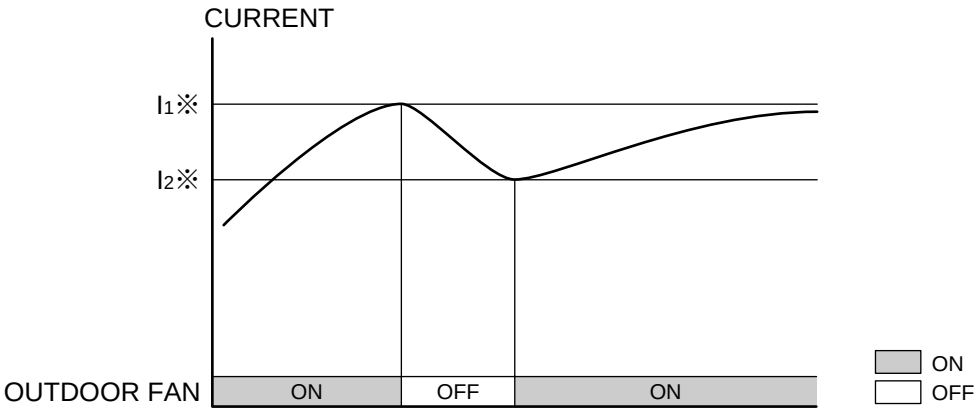
- Method of overload control by checking the temperature of heat-exchanger(indoor)



※

	T1	T2
TAN/TAG-A20GW	57℃	54℃
TAN/TAG-A28GW		
TAN/TAG-A32GW	67℃	64℃

- Method of overload control by checking the operating current



※

	I_1	I_2
TAN/TAG-A20GW	3.6A	3.2A
TAN/TAG-A28GW	3.7A	3.3A
TAN/TAG-A32GW	4.9A	4.5A

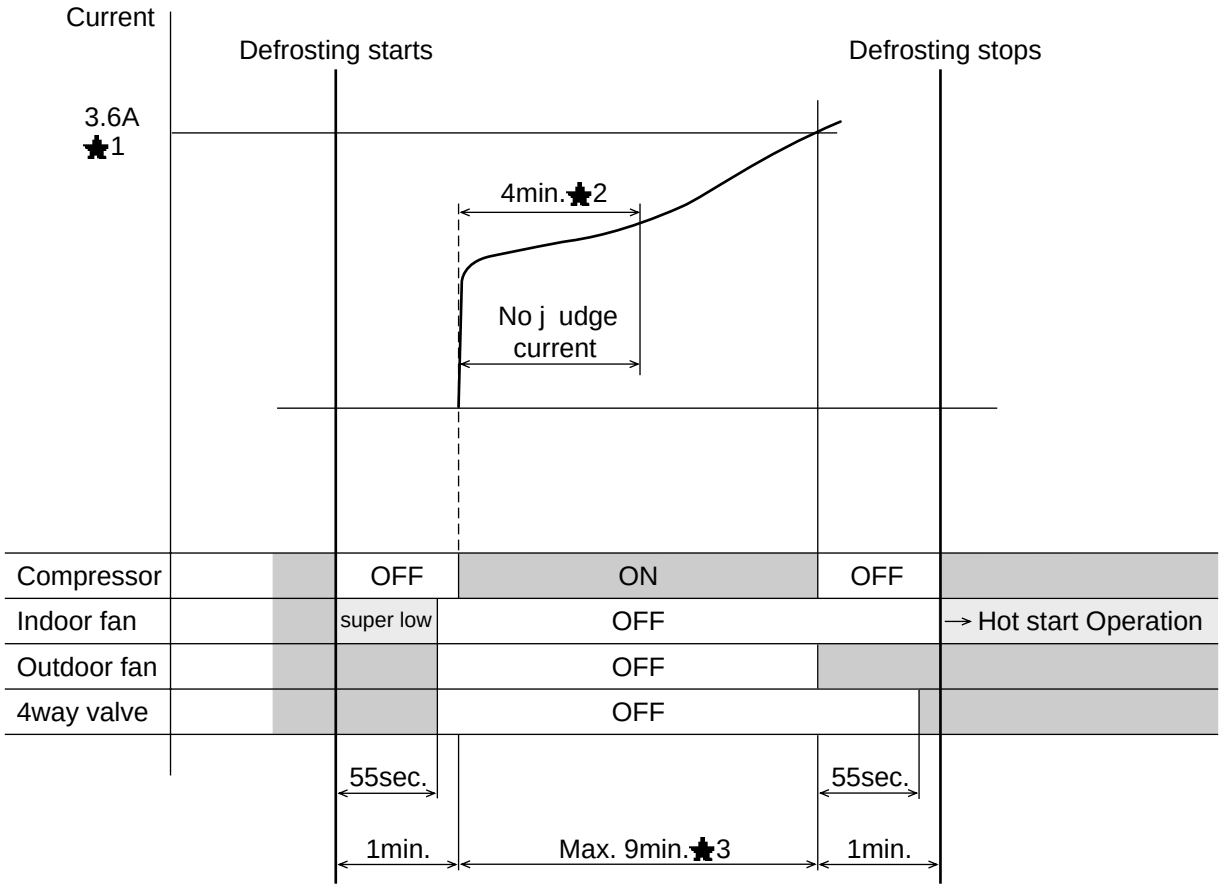
DEFROSTING OPERATION

- Defrosting operation is controlled by room temperature, temperature of indoor heat exchanger and timer switch.
- Defrosting operation starts when

(a) 50 minutes pass after the start of heating operation or after the completion of previous defrosting operation, and while compressor is running, the temperature of indoor heat exchanger falls below " room temperature + 14℃" . Condition(a)

or

(b) accumulated time for the stop of outdoor fan, which is for the protection of compressor from excess current or for the prevention of overheating of indoor heat exchanger, exceeds 90 minutes after the start of heating operation or after the completion of previous defrosting operation. Condition(b)

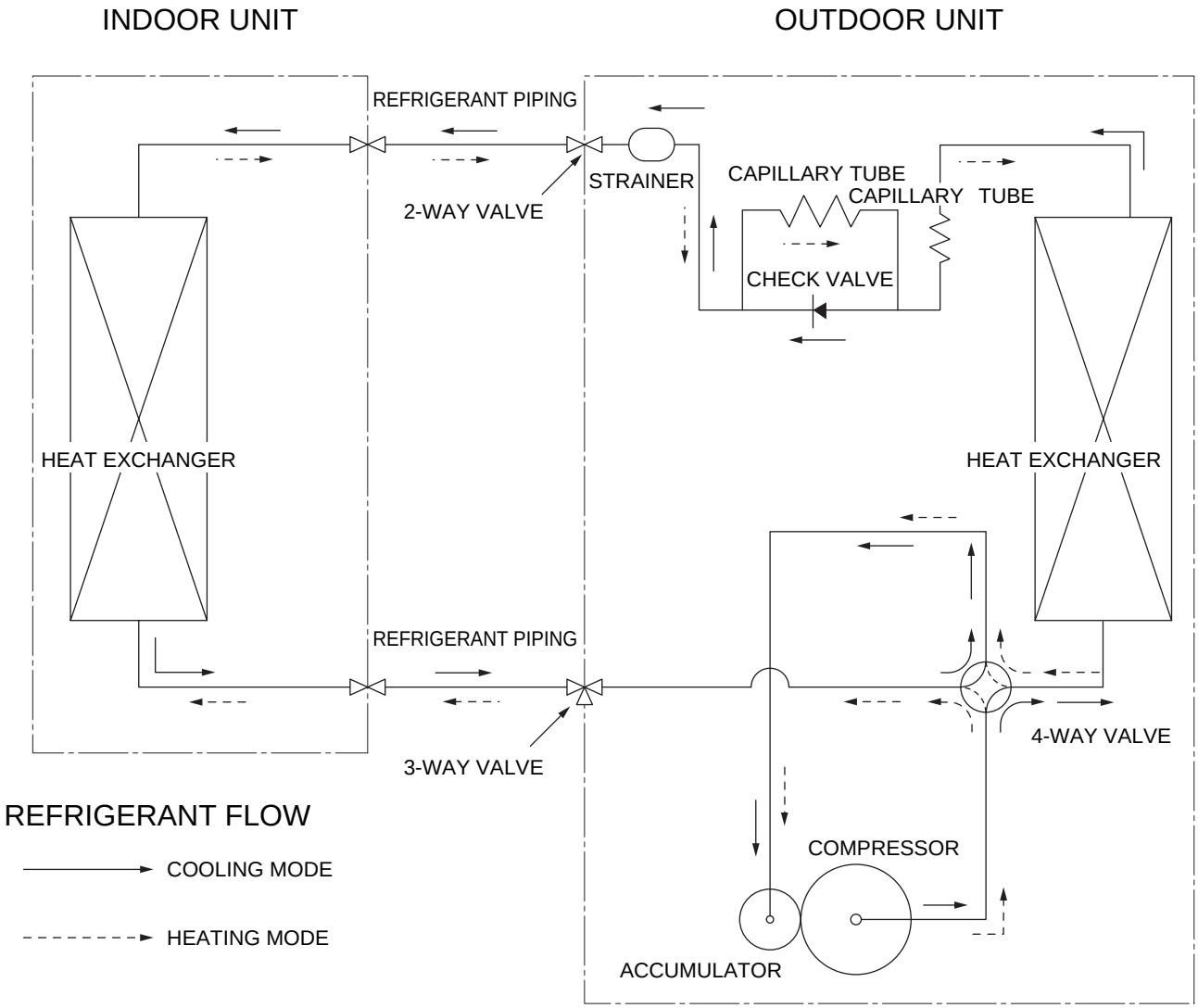


	Condition(a)	Condition(b)
★ 1. TAN/TAG-A20GW	3.6A (or 4.1A once in four defrosting operation)	3.2A
TAN/TAG-A28GW	3.2A (or 5.1A once in four defrosting operation)	3.3A
TAN/TAG-A32GW	3.4A (or 7.0A once in four defrosting operation)	5.0A

	Condition(a)	Condition(b)
★ 2. TAN/TAG-A20GW	4min	2min
TAN/TAG-A28GW	4min	2min
TAN/TAG-A32GW	4min	2min

★ 3. Defrosting operation is called off after 9 minutes at maximum, even if the current value does not reach to the above.

REFRIGERATION CYCLE DIAGRAM



FOR YOUR SAFETY USE

TAN : indoor unit TAG : outdoor unit

● For the safety and proper use and handling of the product, please read and follow the instructions carefully.

● The meaning of the marks below are as follows.

⚠ Danger	Improper use will cause the significant risk of death or serious inj ury of the user.
⚠ Warning	Improper use may cause the risk of death or serious inj ury of the user.

● Please refer the marks below.

⚠	Caution	⚠	High Voltage		Off the Plug	⊘	Prohibited
❗	Strict enforcement	⏚	Connect the earthing cable	♨	High Temperatare		

⚠ Danger

Check Point	● Be sure to off the plug when servicing. It may cause the risk of electric shock.	
	● If leakage of refrigerant occur in the installation, ventilate a room. If the leaked refrigerant is exposed fire, poisonous gas may be generated.	❗
	● **Never remodel appliance.** Use designated parts or accessories to avoid accidents.	❗
	● In case of gas leakage, not only refill the required amount of the refrigerant gas but also find out the gas leakage point and mend it. If the service work has to be suspended before mending the leakage points, be sure to collect the refrigerant gas in the outdoor unit by using pump then fasten the service ports to avoid any further leakage. Poisonous gas may be generated when the leaked refrigerant is exposed to fire.	❗
	● Clean the pins of the plug and insert the plug completely into the outlet.	❗
	● Be sure to change the cable if it is damaged. Do not use damaged cable.	❗
	● Do not use power supply cord extended or connected in halfway.	⊘

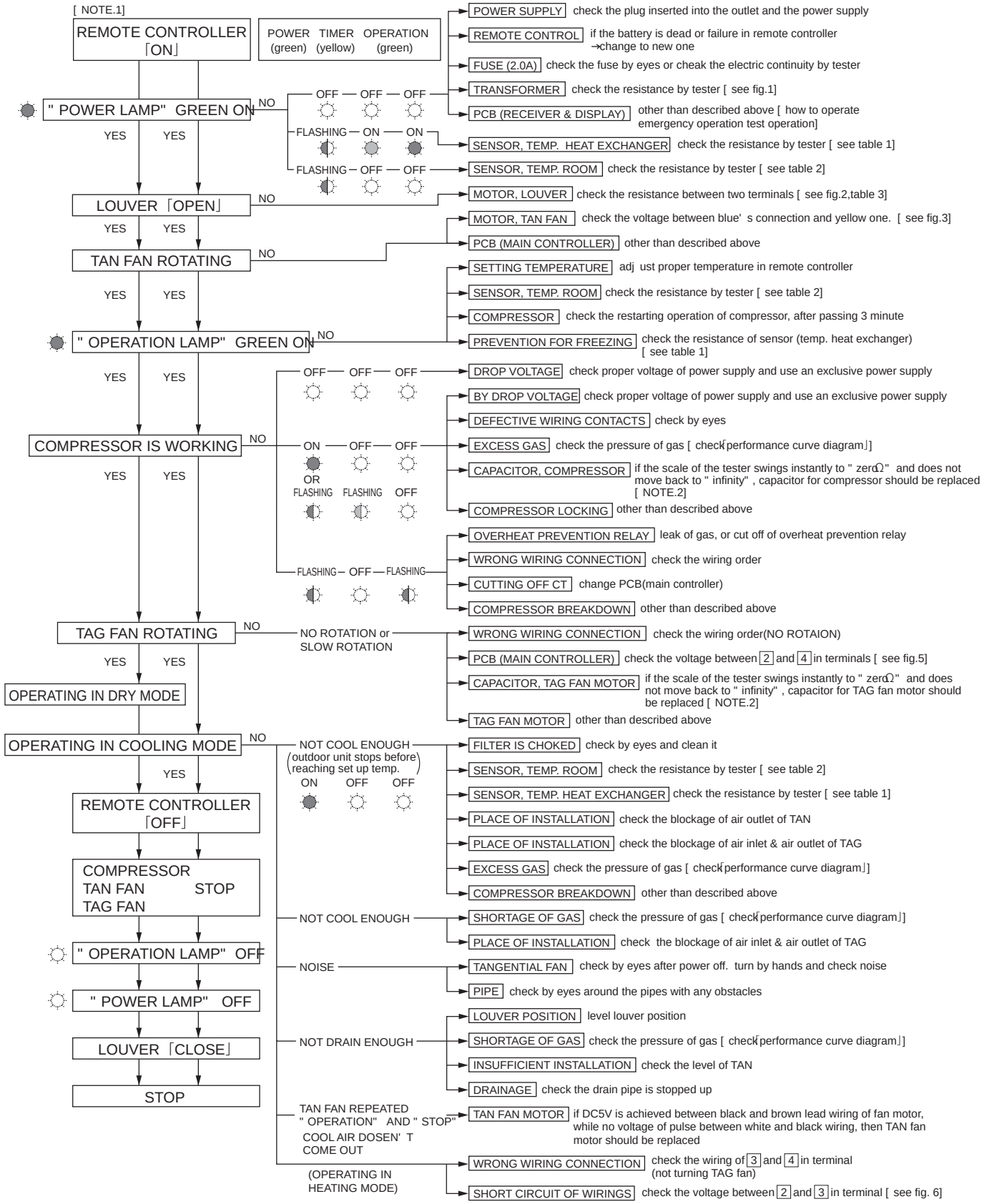
⚠ Warning

Check Point	● Be sure to put the units to earthing works.	⏚
	● Be sure to check the insulated resistance, more than 1M Ω .	

※ The combinations of three LED indicators (ON/Flashing/OFF) provide the self-diagnosis information as most of them shown in the trouble shooting guide.

[Note1] Discharge electricity of the capacitor by making short circuit firstly. Then check the capacitor by tester. Be sure to set up the tester for the measurement of bigger resistance.

DRY & COOLING OPERATION

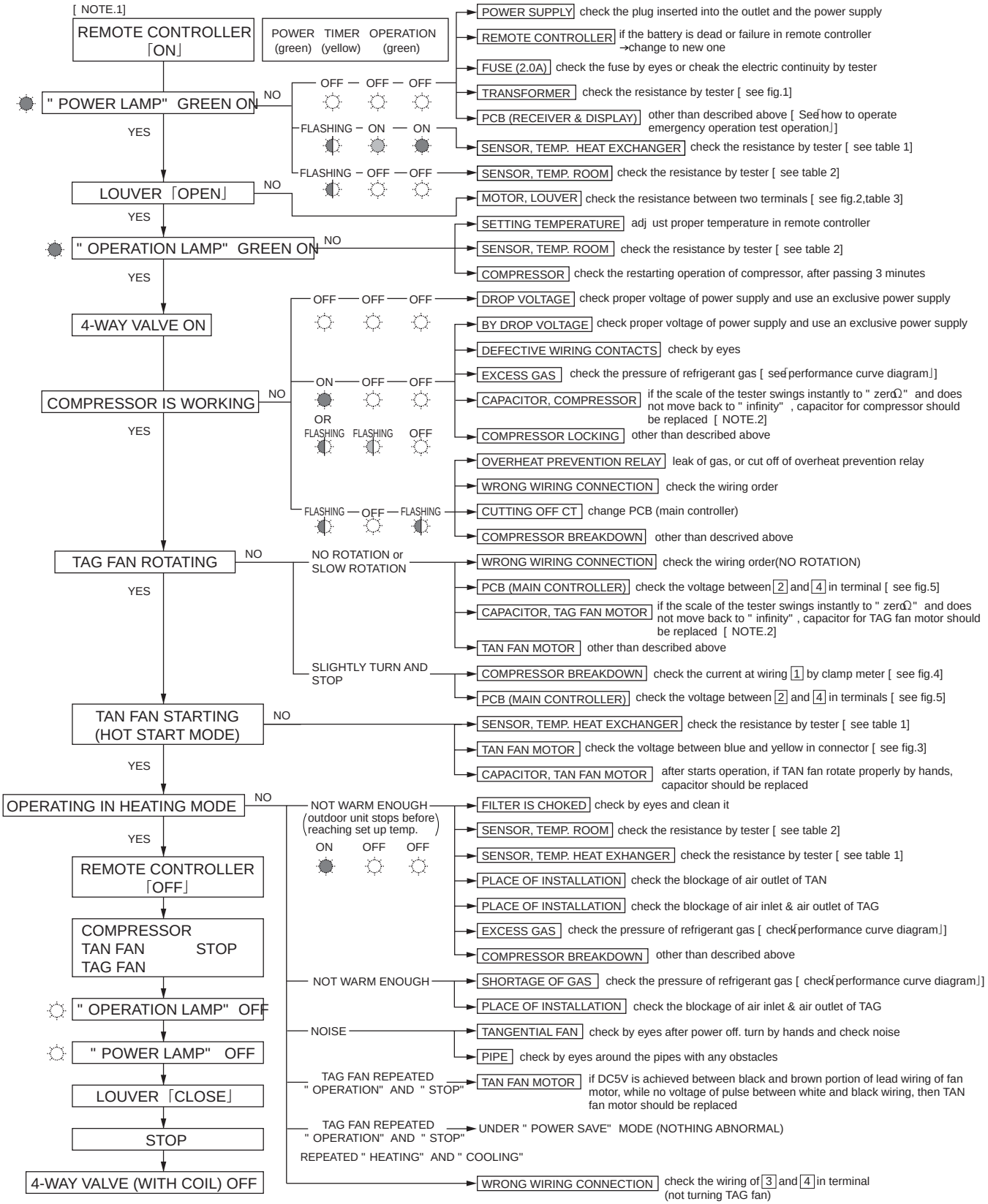

[NOTE.1]
REMOTE CONTROLLER 「ON」
POWER (green) TIMER (yellow) OPERATION (green)
" POWER LAMP" GREEN ON
NO
YES
OFF — OFF — OFF
FLASHING — ON — ON
FLASHING — OFF — OFF
POWER SUPPLY check the plug inserted into the outlet and the power supply
REMOTE CONTROL if the battery is dead or failure in remote controller →change to new one
FUSE (2.0A) check the fuse by eyes or cheak the electric continuity by tester
TRANSFORMER check the resistance by tester [see fig.1]
PCB (RECEIVER & DISPLAY) other than described above [how to operate emergency operation test operation]
SENSOR, TEMP. HEAT EXCHANGER check the resistance by tester [see table 1]
SENSOR, TEMP. ROOM check the resistance by tester [see table 2]
LOUVER 「OPEN」
MOTOR, LOUVER check the resistance between two terminals [see fig.2,table 3]
TAN FAN ROTATING
MOTOR, TAN FAN check the voltage between blue' s connection and yellow one. [see fig.3]
PCB (MAIN CONTROLLER) other than described above
" OPERATION LAMP" GREEN ON
SETTING TEMPERATURE adj ust proper temperature in remote controller
SENSOR, TEMP. ROOM check the resistance by tester [see table 2]
COMPRESSOR check the restarting operation of compressor, after passing 3 minute
PREVENTION FOR FREEZING check the resistance of sensor (temp. heat exchanger) [see table 1]
COMPRESSOR IS WORKING
OFF — OFF — OFF
DROP VOLTAGE check proper voltage of power supply and use an exclusive power supply
BY DROP VOLTAGE check proper voltage of power supply and use an exclusive power supply
DEFECTIVE WIRING CONTACTS check by eyes
ON — OFF — OFF
EXCESS GAS check the pressure of gas [check「performance curve diagram」]
CAPACITOR, COMPRESSOR if the scale of the tester swings instantly to " zerΩ" and does not move back to " infinity" , capacitor for compressor should be replaced [NOTE.2]
OR
FLASHING FLASHING OFF
COMPRESSOR LOCKING other than described above
FLASHING — OFF — FLASHING
OVERHEAT PREVENTION RELAY leak of gas, or cut off of overheat prevention relay
WRONG WIRING CONNECTION check the wiring order
CUTTING OFF CT change PCB(main controller)
COMPRESSOR BREAKDOWN other than described above
TAG FAN ROTATING
NO ROTATION or SLOW ROTATION
WRONG WIRING CONNECTION check the wiring order(NO ROTAION)
PCB (MAIN CONTROLLER) check the voltage between 2 and 4 in terminals [see fig.5]
CAPACITOR, TAG FAN MOTOR if the scale of the tester swings instantly to " zerΩ" and does not move back to " infinity" , capacitor for TAG fan motor should be replaced [NOTE.2]
TAG FAN MOTOR other than described above
OPERATING IN DRY MODE
OPERATING IN COOLING MODE
NOT COOL ENOUGH (outdoor unit stops before reaching set up temp.)
ON OFF OFF
FILTER IS CHOKED check by eyes and clean it
SENSOR, TEMP. ROOM check the resistance by tester [see table 2]
SENSOR, TEMP. HEAT EXCHANGER check the resistance by tester [see table 1]
PLACE OF INSTALLATION check the blockage of air outlet of TAN
PLACE OF INSTALLATION check the blockage of air inlet & air outlet of TAG
EXCESS GAS check the pressure of gas [check「performance curve diagram」]
COMPRESSOR BREAKDOWN other than described above
REMOTE CONTROLLER 「OFF」
COMPRESSOR TAN FAN STOP TAG FAN
" OPERATION LAMP" OFF
" POWER LAMP" OFF
LOUVER 「CLOSE」
STOP
NOT COOL ENOUGH
SHORTAGE OF GAS check the pressure of gas [check「performance curve diagram」]
PLACE OF INSTALLATION check the blockage of air inlet & air outlet of TAG
NOISE
TANGENTIAL FAN check by eyes after power off. turn by hands and check noise
PIPE check by eyes around the pipes with any obstacles
NOT DRAIN ENOUGH
LOUVER POSITION level louver position
SHORTAGE OF GAS check the pressure of gas [check「performance curve diagram」]
INSUFFICIENT INSTALLATION check the level of TAN
DRAINAGE check the drain pipe is stopped up
TAN FAN REPEATED " OPERATION" AND " STOP" COOL AIR DOSEN' T COME OUT
TAN FAN MOTOR if DC5V is achieved between black and brown lead wiring of fan motor, while no voltage of pulse between white and black wiring, then TAN fan motor should be replaced
(OPERATING IN HEATING MODE)
WRONG WIRING CONNECTION check the wiring of 3 and 4 in terminal (not turning TAG fan)
SHORT CIRCUIT OF WIRINGS check the voltage between 2 and 3 in terminal [see fig. 6]

[NOTE.1] If alarm" " appears 15 sec. after main power on, PCB(MAIN CONTROLLER) is defective.

[NOTE.2] Measure the resistance by changing the pole of the tester by turns.

★ 1～4 Terminal Number on Terminal Block of TAN. (indoor unit)

HEATING OPERATION


[NOTE.1]
REMOTE CONTROLLER 「ON」
POWER (green) TIMER (yellow) OPERATION (green)
" POWER LAMP" GREEN ON
NO
YES
OFF — OFF — OFF
FLASHING — ON — ON
FLASHING — OFF — OFF
POWER SUPPLY check the plug inserted into the outlet and the power supply
REMOTE CONTROLLER if the battery is dead or failure in remote controller →change to new one
FUSE (2.0A) check the fuse by eyes or cheak the electric continuity by tester
TRANSFORMER check the resistance by tester [see fig.1]
PCB (RECEIVER & DISPLAY) other than described above [See how to operate emergency operation test operation」]
SENSOR, TEMP. HEAT EXCHANGER check the resistance by tester [see table 1]
SENSOR, TEMP. ROOM check the resistance by tester [see table 2]
LOUVER 「OPEN」
NO
YES
MOTOR, LOUVER check the resistance between two terminals [see fig.2,table 3]
" OPERATION LAMP" GREEN ON
NO
YES
SETTING TEMPERATURE adj ust proper temperature in remote controller
SENSOR, TEMP. ROOM check the resistance by tester [see table 2]
COMPRESSOR check the restarting operation of compressor, after passing 3 minutes
4-WAY VALVE ON
OFF — OFF — OFF
DROP VOLTAGE check proper voltage of power supply and use an exclusive power supply
COMPRESSOR IS WORKING
NO
YES
ON — OFF — OFF
OR
FLASHING FLASHING OFF
BY DROP VOLTAGE check proper voltage of power supply and use an exclusive power supply
DEFECTIVE WIRING CONTACTS check by eyes
EXCESS GAS check the pressure of refrigerant gas [see performance curve diagram」]
CAPACITOR, COMPRESSOR if the scale of the tester swings instantly to " zero Ω" and does not move back to " infinity" , capacitor for compressor should be replaced [NOTE.2]
COMPRESSOR LOCKING other than described above
FLASHING — OFF — FLASHING
OVERHEAT PREVENTION RELAY leak of gas, or cut off of overheat prevention relay
WRONG WIRING CONNECTION check the wiring order
CUTTING OFF CT change PCB (main controller)
COMPRESSOR BREAKDOWN other than descrived above
TAG FAN ROTATING
NO
YES
NO ROTATION or SLOW ROTATION
WRONG WIRING CONNECTION check the wiring order(NO ROTATION)
PCB (MAIN CONTROLLER) check the voltage between 2 and 4 in terminal [see fig.5]
CAPACITOR, TAG FAN MOTOR if the scale of the tester swings instantly to " zero Ω" and does not move back to " infinity" , capacitor for TAG fan motor should be replaced [NOTE.2]
TAN FAN MOTOR other than described above
SLIGHTLY TURN AND STOP
COMPRESSOR BREAKDOWN check the current at wiring 1 by clamp meter [see fig.4]
PCB (MAIN CONTROLLER) check the voltage between 2 and 4 in terminals [see fig.5]
TAN FAN STARTING (HOT START MODE)
NO
YES
SENSOR, TEMP. HEAT EXCHANGER check the resistance by tester [see table 1]
TAN FAN MOTOR check the voltage between blue and yellow in connector [see fig.3]
CAPACITOR, TAN FAN MOTOR after starts operation, if TAN fan rotate properly by hands, capacitor should be replaced
OPERATING IN HEATING MODE
NO
YES
NOT WARM ENOUGH (outdoor unit stops before reaching set up temp.
ON OFF OFF
FILTER IS CHOKED check by eyes and clean it
SENSOR, TEMP. ROOM check the resistance by tester [see table 2]
SENSOR, TEMP. HEAT EXHANGER check the resistance by tester [see table 1]
PLACE OF INSTALLATION check the blockage of air outlet of TAN
PLACE OF INSTALLATION check the blockage of air inlet & air outlet of TAG
EXCESS GAS check the pressure of refrigerant gas [check performance curve diagram」]
COMPRESSOR BREAKDOWN other than described above
REMOTE CONTROLLER 「OFF」
COMPRESSOR
TAN FAN STOP
TAG FAN
" OPERATION LAMP" OFF
" POWER LAMP" OFF
LOUVER 「CLOSE」
STOP
4-WAY VALVE (WITH COIL) OFF
NOT WARM ENOUGH
SHORTAGE OF GAS check the pressure of refrigerant gas [check performance curve diagram」]
PLACE OF INSTALLATION check the blockage of air inlet & air outlet of TAG
NOISE
TANGENTIAL FAN check by eyes after power off. turn by hands and check noise
PIPE check by eyes around the pipes with any obstacles
TAG FAN REPEATED " OPERATION" AND " STOP"
TAN FAN MOTOR if DC5V is achieved between black and brown portion of lead wiring of fan motor, while no voltage of pulse between white and black wiring, then TAN fan motor should be replaced
TAG FAN REPEATED " OPERATION" AND " STOP"
UNDER " POWER SAVE" MODE (NOTHING ABNORMAL)
REPEATED " HEATING" AND " COOLING"
WRONG WIRING CONNECTION check the wiring of 3 and 4 in terminal (not turning TAG fan)

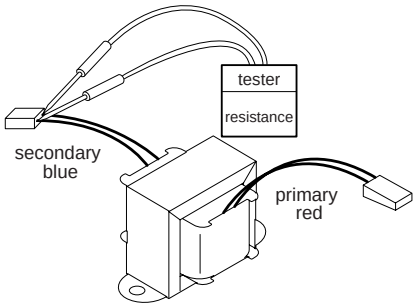
[NOTE.1] If alarm " appears 15 sec. after main power on, PCB(MAIN CONTROLLER) is defective.

[NOTE.2] Measure the resistance by changing the pole of the tester by turns.

★ 1～4 Terminal Number on Terminal Block of TAN. (indoor unit)

CHECK A FOLLOWING STEPS

〔fig. 1〕 Resistance of transformer

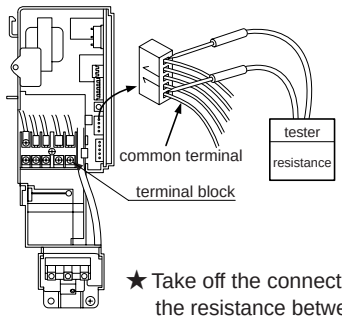


● Transformer resistance

primary red-red	about 800 Ω
secondary blue-blue	about 3 Ω

《Check the power source》
The transformer is located in inner part in the control box/
Measure taking off the connectors (primary & secondary)

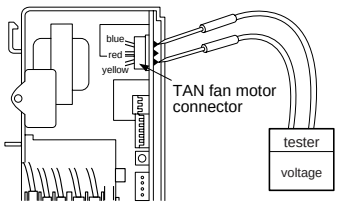
〔fig. 2〕 Resistance of louver motor



★Take off the connector and check the resistance between the terminals

〔fig. 3〕 Voltage of RC fan motor

attention electric shock

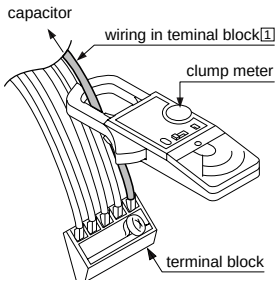


Normal : 110V～ 230V

《Check the TAN PCB(main controller)》
Measure the voltage between the connector pins in the back of PCB(main controller)

〔fig. 4〕 Current of compressor (operating in heating mode)

attention electric shock

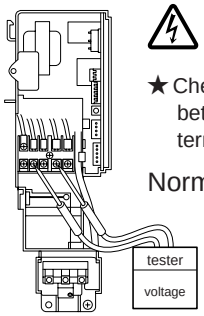


〔table 4〕 Current of wiring in terminal

	more than about
TAN/TAG-A20GW	3A
TAN/TAG-A28GW	3A
TAN/TAG-A32GW	4A

※ Check the current of wiring in terminal 1 and if the current stays at the level above shown, compressor is defective. (heating operation only)

〔fig. 5〕 Voltage of PCB (main controller)

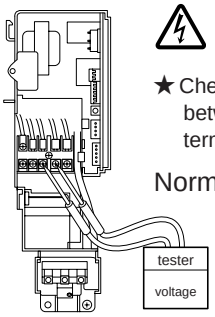


attention electric shock

★Check the voltage between 2 and 4 in terminal

Normal : 207V～ 253V

〔fig. 6〕 Voltage of link line (operation in dry & cooling mode)



attention electric shock

★Check the voltage between 2 and 3 in terminal

Normal : 0V

ELECTRIC CHARACTER

〔table 1〕 Sensor, temp. heat exchanger

Temp. (℃)	Resistance (kΩ)
10	19
15	15
20	12
25	10
30	8
35	7

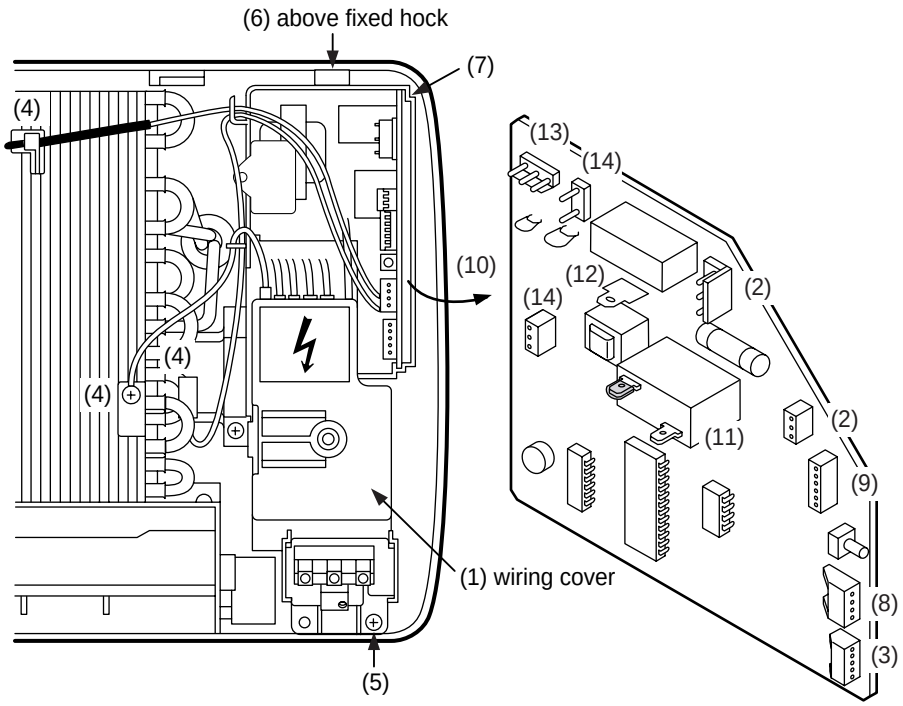
〔table 2〕 Sensor, temp. room

Temp. (℃)	Resistance (kΩ)
10	47
15	37
20	29
25	23
30	18
35	15

〔table 3〕 Louver motor

Common terminal (lower part) ～ Each terminal
360 ～ 390 Ω
Between terminals
720 ～ 780 Ω

HOW TO DETACH CONTROL BOX AND MAIN CONTROLLER



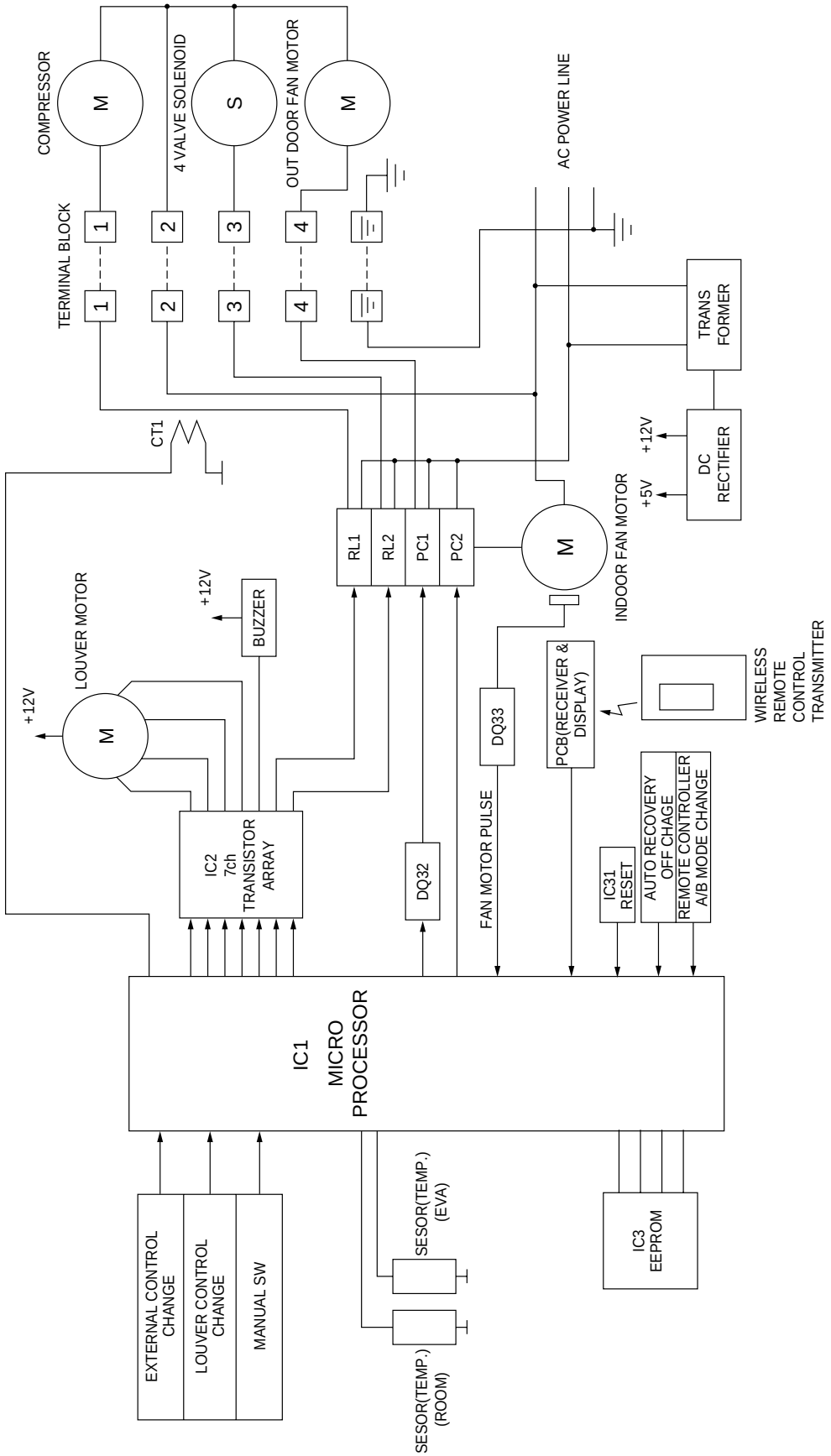
《How to detach control box assembly》

(1) Detach wiring cover and connecting cables.
(2) Pull out connectors of TAN fan motor. (2 places)
(3) Pull out connector of louver motor.
(4) Detach sensors (room+ heat exchanger) and an earthing screw. (3 places)
(5) Detach a screw for PCB casing.
(6) Shift control box assembly below and detach above fixed hock.
(7) Draw out the whole control box assembly for this side.

《How to detach PCB (main controller)》

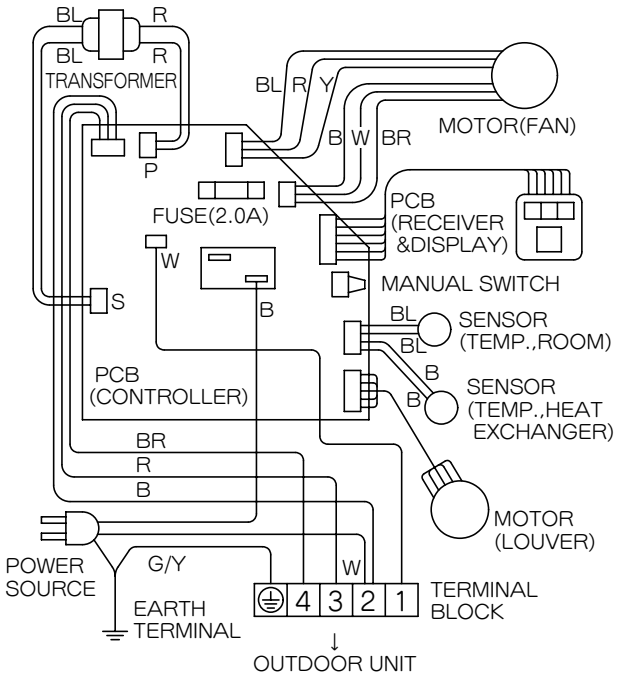
(8) Pull out connector of sensors (room+ heat exchanger).
(9) Pull out connector of PCB (receiver & display).
(10) Pull out PCB (main controller) from control box assembly for this side.
(11) Pull out terminal with pushing locking lever simultaneously.
(12) Pull out terminal.
(13) Pull out connector from terminal block to PCB (main controller).
(14) Pull out connectors of transformer. (2 places)

BLOCK DIAGRAM

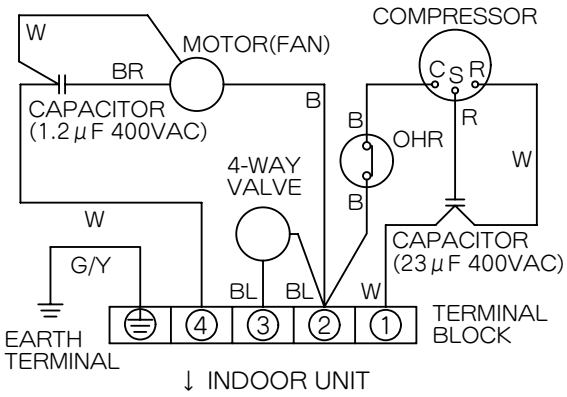


WIRING DIAGRAM

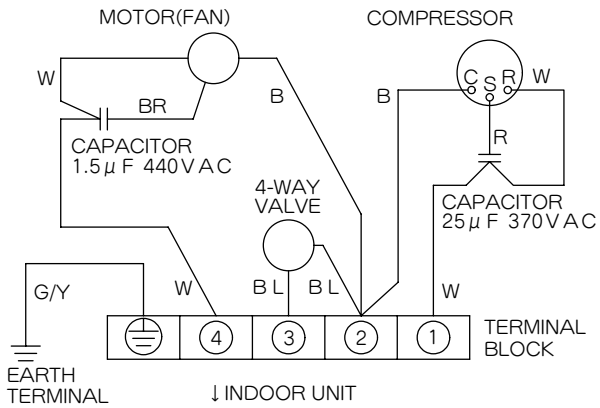
TAN-A20HW, TAN-A28HW, TAN-A32HW



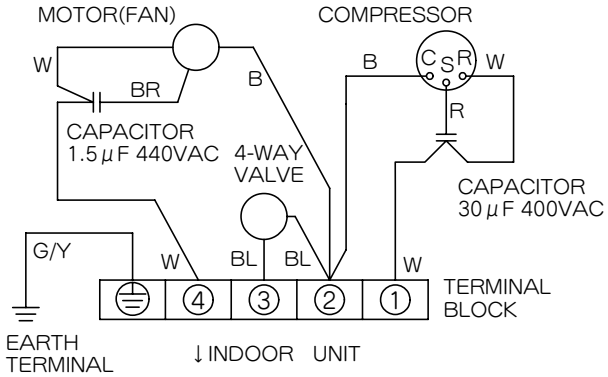
TAG-A20HW



TAG-A28HW



TAG-A32HW

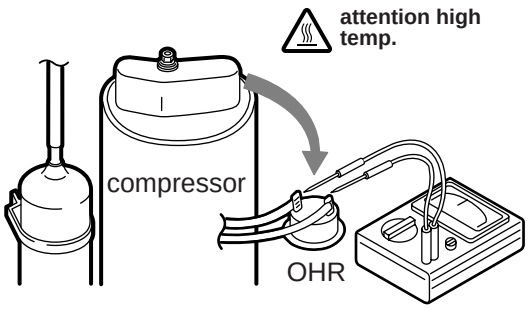


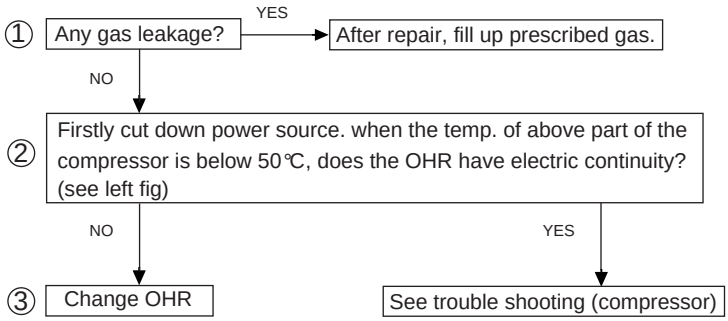
TAN : INDOOR UNIT
TAG : OUTDOOR UNIT

B : BLACK
BL : BLUE
BR : BROWN
G : GREEN
R : RED
W : WHITE
Y : YELLOW

TAN/TAG-A20HW

OVERHEAT PREVENTIVE RELAY(OHR)



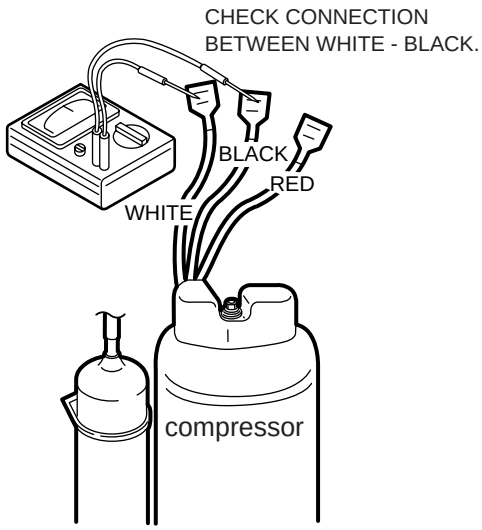

① Any gas leakage?
YES
After repair, fill up prescribed gas.
NO
② Firstly cut down power source. when the temp. of above part of the compressor is below 50℃, does the OHR have electric continuity? (see left fig)
NO
YES
③ Change OHR
See trouble shooting (compressor)

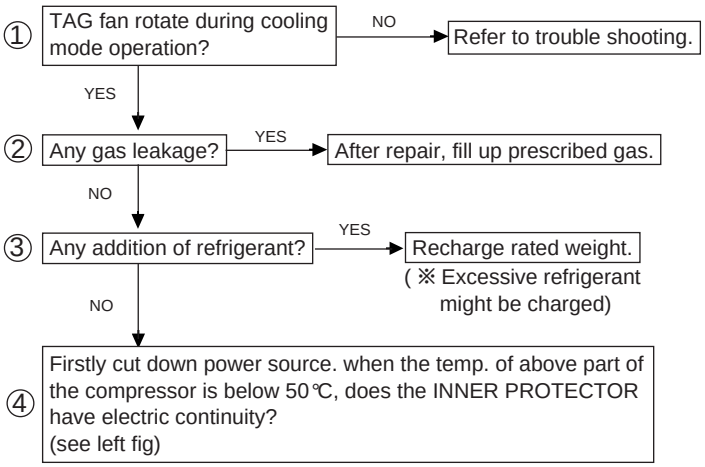
Phenomenon	OHR works
Cause	① Gas leakage ② OHR is defective

TAN/TAG-A28HW, TAN/TAG-A32HW(INNER PROTECTOR)

OVERHEAT PREVENTIVE RELAY(INNER PROTECTOR)

INNER PROTECTOR




① TAG fan rotate during cooling mode operation?
NO
Refer to trouble shooting.
YES
② Any gas leakage?
YES
After repair, fill up prescribed gas.
NO
③ Any addition of refrigerant?
YES
Recharge rated weight.
(※ Excessive refrigerant might be charged)
NO
④ Firstly cut down power source. when the temp. of above part of the compressor is below 50℃, does the INNER PROTECTOR have electric continuity? (see left fig)

Phenomenon	INNER PROTECTOR works
Cause	① Excessive refrigerant ② TAG fan does not rotate ③ Gas leakage ④ Compressor does not operate (INNER PROTECTOR is defective)

REMARKS FOR GAS PRESSURE CHECK AND CHARGING

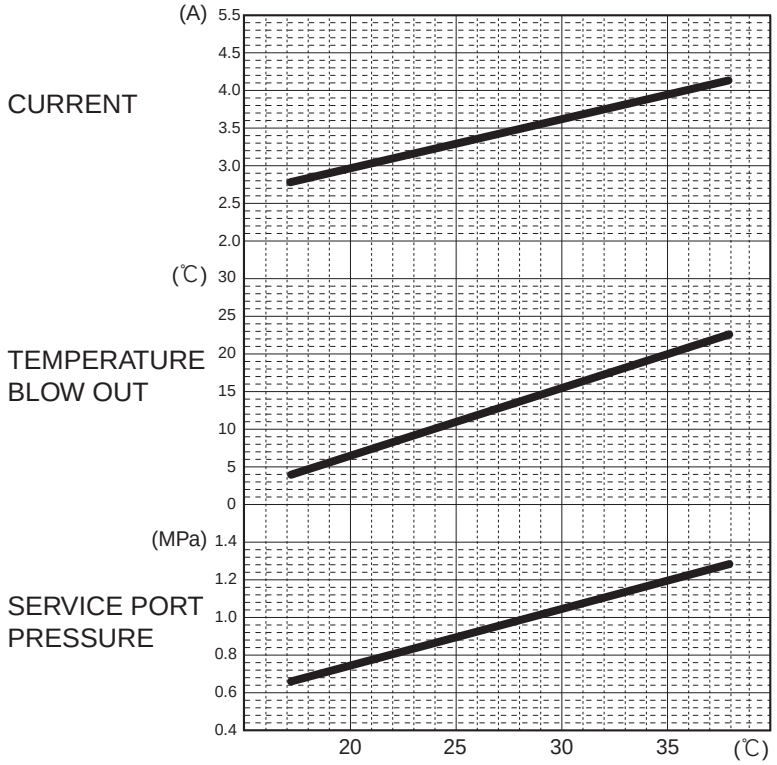
If you find substantial diffrence in performance compared with PERFORMANCE CURVE as shown in the following pages, recharge the refrigerant.
(In order to avoid excessive charging, purge all the remaining refrigerant first and then evacuate the unit completely with vacuum pump and finally apply rated volume charging of refrigerant.)
Charging of refrigerant should be done by cooling operation, because the pressure at service valve will be too high at heating cycle, then the heating performance characteristics must be checked by restarting of heating operation.

Piping size	Liquid side	6.35mm
	Gas side	9.52mm
Max. tube length		10m
Max. height difference		5m

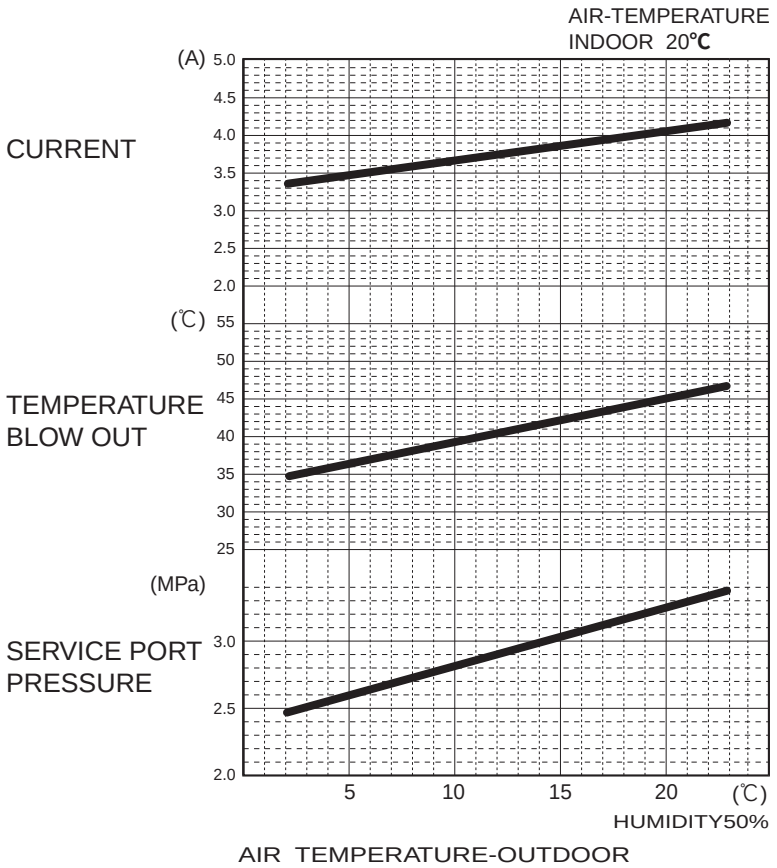
PERFORMANCE CURVE DIAGRAM

TAN/TAG-A20HW

COOLING



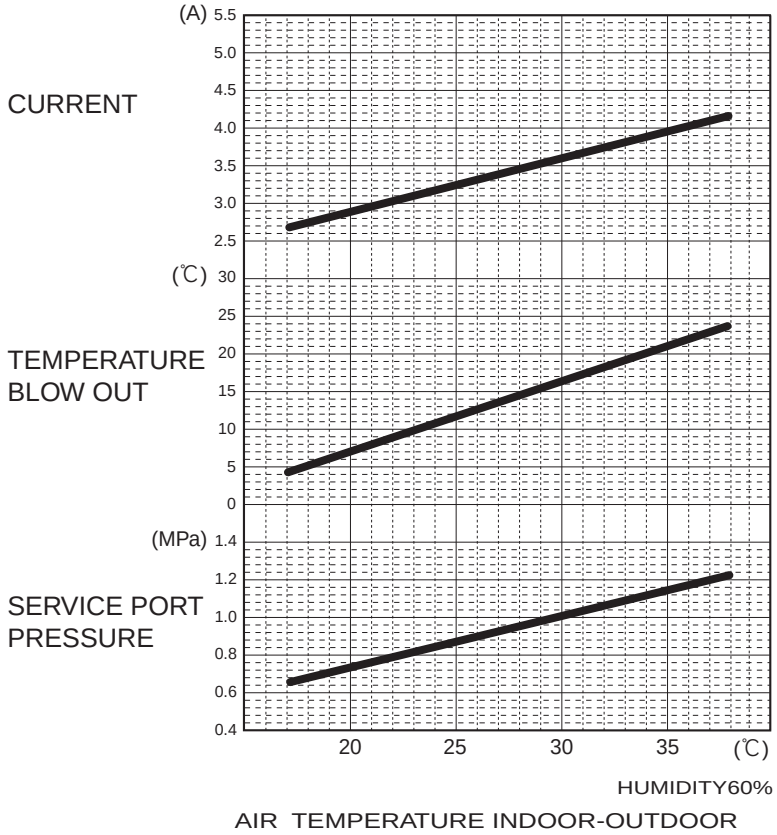
HEATING



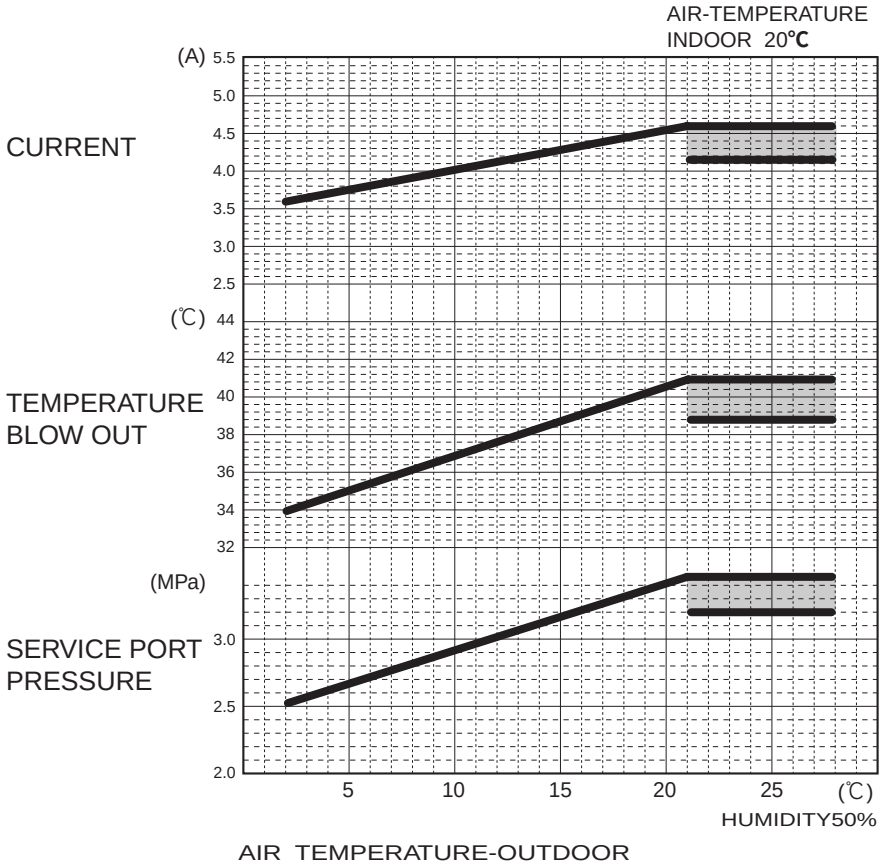
PERFORMANCE CURVE DIAGRAM

TAN/TAG-A28HW

COOLING



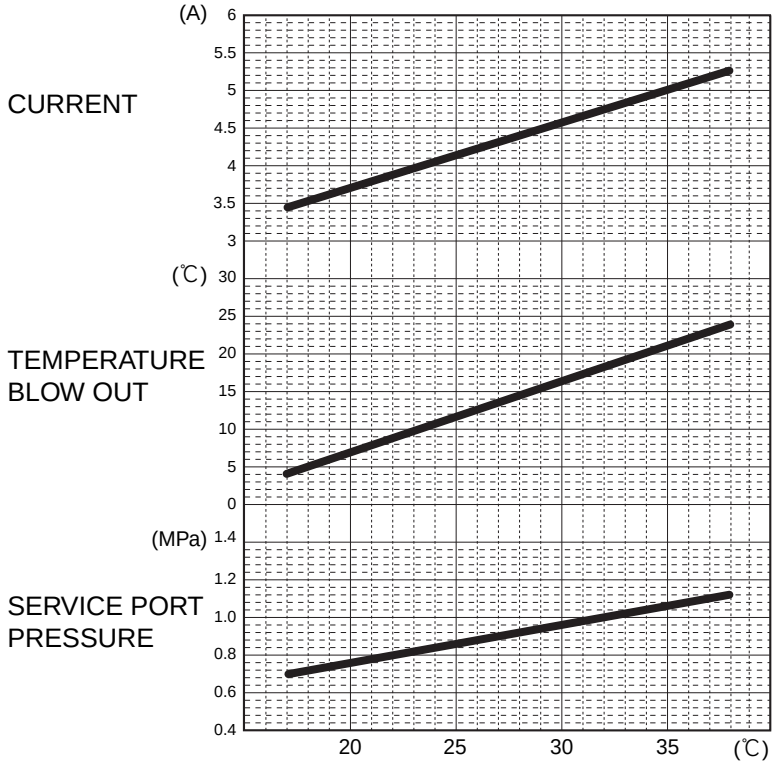
HEATING



PERFORMANCE CURVE DIAGRAM

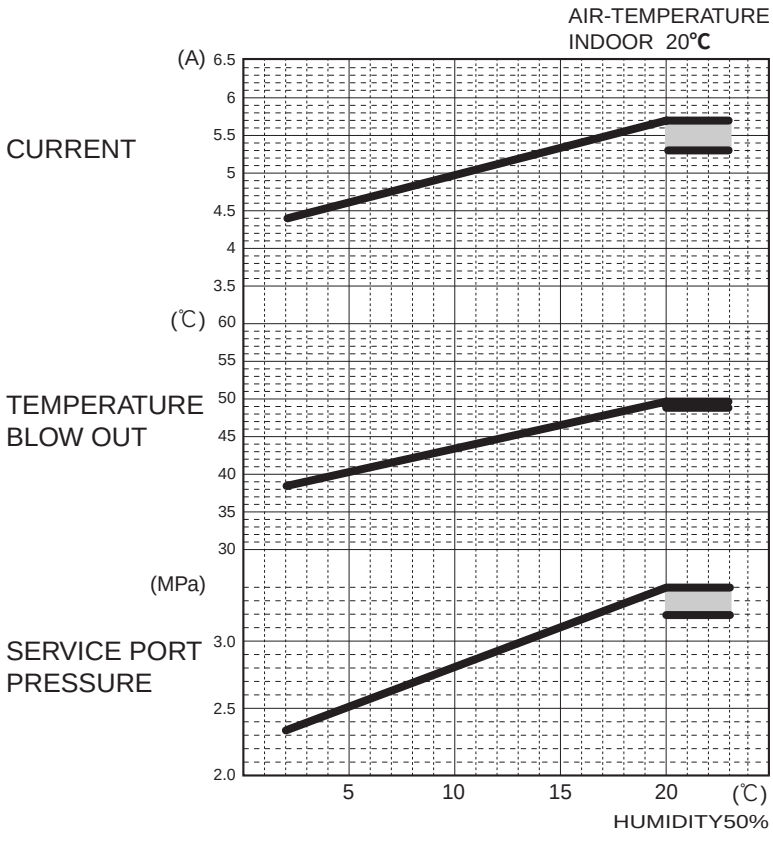
TAN/TAG-A32HW

COOLING



AIR TEMPERATURE INDOOR-OUTDOOR

HEATING



AIR TEMPERATURE-OUTDOOR

SENSOR, ROOM TEMPERATURE

TAN SENSOR, ROOM TEMPERATURE
B CONSTANT·····4200
STANDARD TEMPERATURE·····25.0℃
STANDARD RESISTANCE·····23kΩ

T (℃)	R (KΩ)	Voltage (V)	T (℃)	R (KΩ)	Voltage (V)
-30.0	558.6	0.17	-10.0	150.1	0.59
-29.5	539.2	0.18	-9.5	145.6	0.60
-29.0	520.4	0.19	-9.0	141.3	0.62
-28.5	502.4	0.19	-8.5	137.1	0.64
-28.0	485.1	0.20	-8.0	133.0	0.65
-27.5	468.5	0.20	-7.5	129.1	0.67
-27.0	452.5	0.21	-7.0	125.3	0.69
-26.5	437.1	0.22	-6.5	121.7	0.71
-26.0	422.2	0.23	-6.0	118.1	0.72
-25.5	408.0	0.23	-5.5	114.7	0.74
-25.0	394.3	0.24	-5.0	111.4	0.76
-24.5	381.1	0.25	-4.5	108.2	0.78
-24.0	368.3	0.26	-4.0	105.1	0.80
-23.5	356.1	0.27	-3.5	102.1	0.82
-23.0	344.3	0.27	-3.0	99.2	0.84
-22.5	333.0	0.28	-2.5	96.4	0.86
-22.0	322.0	0.29	-2.0	93.7	0.88
-21.5	311.5	0.30	-1.5	91.0	0.90
-21.0	301.3	0.31	-1.0	88.5	0.92
-20.5	291.5	0.32	-0.5	86.0	0.94
-20.0	282.1	0.33	0.0	83.6	0.97
-19.5	273.0	0.34	0.5	81.3	0.99
-19.0	264.3	0.35	1.0	79.0	1.01
-18.5	255.8	0.36	1.5	76.9	1.03
-18.0	247.7	0.37	2.0	74.8	1.06
-17.5	239.8	0.38	2.5	72.7	1.08
-17.0	232.2	0.40	3.0	70.7	1.10
-16.5	224.9	0.41	3.5	68.8	1.13
-16.0	217.9	0.42	4.0	67.0	1.15
-15.5	211.1	0.43	4.5	65.1	1.17
-15.0	204.5	0.45	5.0	63.4	1.20
-14.5	198.2	0.46	5.5	61.7	1.22
-14.0	192.0	0.47	6.0	60.1	1.25
-13.5	186.1	0.49	6.5	58.5	1.27
-13.0	180.4	0.50	7.0	56.9	1.30
-12.5	174.9	0.51	7.5	55.4	1.33
-12.0	169.6	0.53	8.0	54.0	1.35
-11.5	164.5	0.54	8.5	52.5	1.38
-11.0	159.5	0.56	9.0	51.2	1.41
-10.5	154.7	0.57	9.5	49.8	1.43
-10.0	150.1	0.59	10.0	48.5	1.46

TAN SENSOR, ROOM TEMPERATURE
B CONSTANT·····4200
STANDARD TEMPERATURE·····25.0℃
STANDARD RESISTANCE·····23kΩ

T (℃)	R (KΩ)	Voltage (V)	T (℃)	R (KΩ)	Voltage (V)
10.0	48.5	1.46	30.0	18.2	2.62
10.5	47.3	1.49	30.5	17.8	2.64
11.0	46.1	1.51	31.0	17.4	2.67
11.5	44.9	1.54	31.5	17.0	2.70
12.0	43.7	1.57	32.0	16.6	2.73
12.5	42.6	1.60	32.5	16.3	2.76
13.0	41.5	1.62	33.0	15.9	2.78
13.5	40.5	1.65	33.5	15.6	2.81
14.0	39.5	1.68	34.0	15.2	2.84
14.5	38.5	1.71	34.5	14.9	2.87
15.0	37.5	1.74	35.0	14.6	2.89
15.5	36.6	1.77	35.5	14.2	2.92
16.0	35.7	1.80	36.0	13.9	2.95
16.5	34.8	1.83	36.5	13.6	2.97
17.0	33.9	1.85	37.0	13.3	3.00
17.5	33.1	1.88	37.5	13.0	3.03
18.0	32.3	1.91	38.0	12.8	3.05
18.5	31.5	1.94	38.5	12.5	3.08
19.0	30.7	1.97	39.0	12.2	3.10
19.5	30.0	2.00	39.5	12.0	3.13
20.0	29.3	2.03	40.0	11.7	3.15
20.5	28.5	2.06	40.5	11.5	3.18
21.0	27.9	2.09	41.0	11.2	3.20
21.5	27.2	2.12	41.5	11.0	3.23
22.0	26.5	2.15	42.0	10.7	3.25
22.5	25.9	2.18	42.5	10.5	3.28
23.0	25.3	2.21	43.0	10.3	3.30
23.5	24.7	2.24	43.5	10.1	3.32
24.0	24.1	2.27	44.0	9.9	3.35
24.5	23.6	2.30	44.5	9.7	3.37
25.0	23.0	2.33	45.0	9.5	3.39
25.5	22.5	2.35	45.5	9.3	3.41
26.0	21.9	2.38	46.0	9.1	3.44
26.5	21.4	2.41	46.5	8.9	3.46
27.0	20.9	2.44	47.0	8.7	3.48
27.5	20.5	2.47	47.5	8.6	3.50
28.0	20.0	2.50	48.0	8.4	3.52
28.5	19.5	2.53	48.5	8.2	3.54
29.0	19.1	2.56	49.0	8.0	3.57
29.5	18.6	2.59	49.5	7.9	3.59
30.0	18.2	2.62	50.0	7.7	3.61

SENSOR, DEFROST TEMPERATURE

TAG SENSOR, HEAT EXCHANGER TEMPERATURE
B CONSTANT·····3700
STANDARD TEMPERATURE·····25.0℃
STANDARD RESISTANCE·····10kΩ

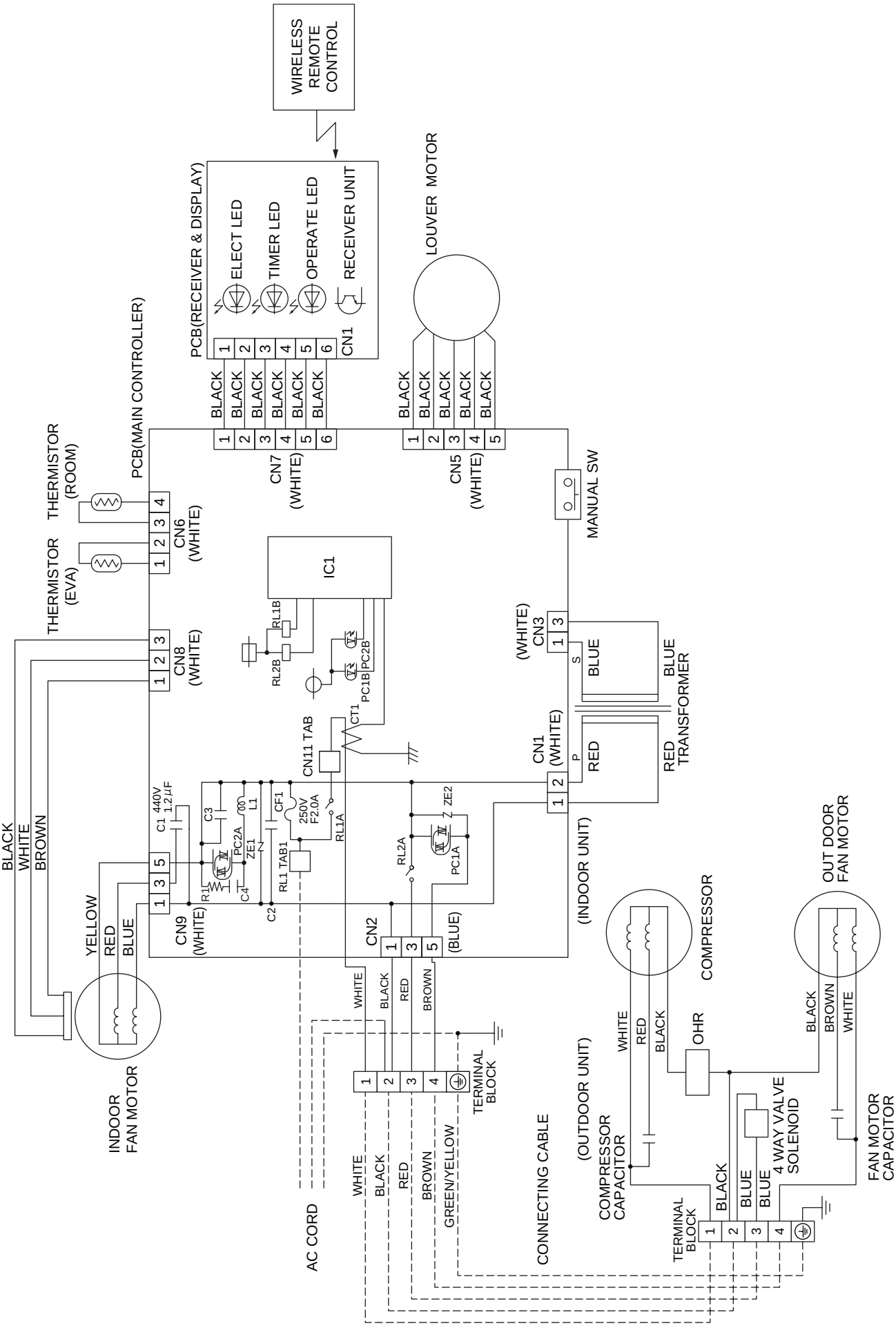
T(℃)	R(kΩ)	Voltage(V)	T(℃)	R(kΩ)	Voltage(V)
-40.0	318.1	0.30	0.0	31.1	1.96
-39.0	297.2	0.32	1.0	29.6	2.01
-38.0	277.9	0.34	2.0	28.2	2.07
-37.0	260.0	0.36	3.0	26.9	2.13
-36.0	243.4	0.38	4.0	25.6	2.19
-35.0	228.0	0.40	5.0	24.4	2.25
-34.0	213.6	0.43	6.0	23.3	2.31
-33.0	200.3	0.45	7.0	22.2	2.37
-32.0	187.9	0.48	8.0	21.2	2.43
-31.0	176.4	0.51	9.0	20.2	2.49
-30.0	165.6	0.54	10.0	19.3	2.54
-29.0	155.6	0.57	11.0	18.4	2.60
-28.0	146.3	0.60	12.0	17.6	2.66
-27.0	137.6	0.63	13.0	16.8	2.72
-26.0	129.5	0.67	14.0	16.1	2.77
-25.0	121.9	0.70	15.0	15.4	2.83
-24.0	114.8	0.74	16.0	14.7	2.88
-23.0	108.2	0.78	17.0	14.1	2.93
-22.0	102.0	0.82	18.0	13.5	2.99
-21.0	96.2	0.86	19.0	12.9	3.04
-20.0	90.8	0.90	20.0	12.4	3.09
-19.0	85.7	0.95	21.0	11.8	3.14
-18.0	81.0	0.99	22.0	11.3	3.19
-17.0	76.5	1.04	23.0	10.9	3.24
-16.0	72.3	1.08	24.0	10.4	3.29
-15.0	68.4	1.13	25.0	10.0	3.33
-14.0	64.7	1.18	26.0	9.6	3.38
-13.0	61.3	1.23	27.0	9.2	3.42
-12.0	58.0	1.28	28.0	8.8	3.47
-11.0	55.0	1.33	29.0	8.5	3.51
-10.0	52.1	1.39	30.0	8.1	3.55
-9.0	49.4	1.44	31.0	7.8	3.59
-8.0	46.9	1.50	32.0	7.5	3.63
-7.0	44.5	1.55	33.0	7.2	3.67
-6.0	42.2	1.61	34.0	7.0	3.71
-5.0	40.1	1.66	35.0	6.7	3.75
-4.0	38.1	1.72	36.0	6.4	3.78
-3.0	36.2	1.78	37.0	6.2	3.82
-2.0	34.4	1.84	38.0	6.0	3.85
-1.0	32.7	1.90	39.0	5.7	3.89
0.0	31.1	1.96	40.0	5.5	3.92

THERMISTOR RESISTANCE CHART

TAG SENSOR, HEAT EXCHANGER TEMPERATURE
B CONSTANT·····3700
STANDARD TEMPERATURE·····25.0℃
STANDARD RESISTANCE·····10kΩ

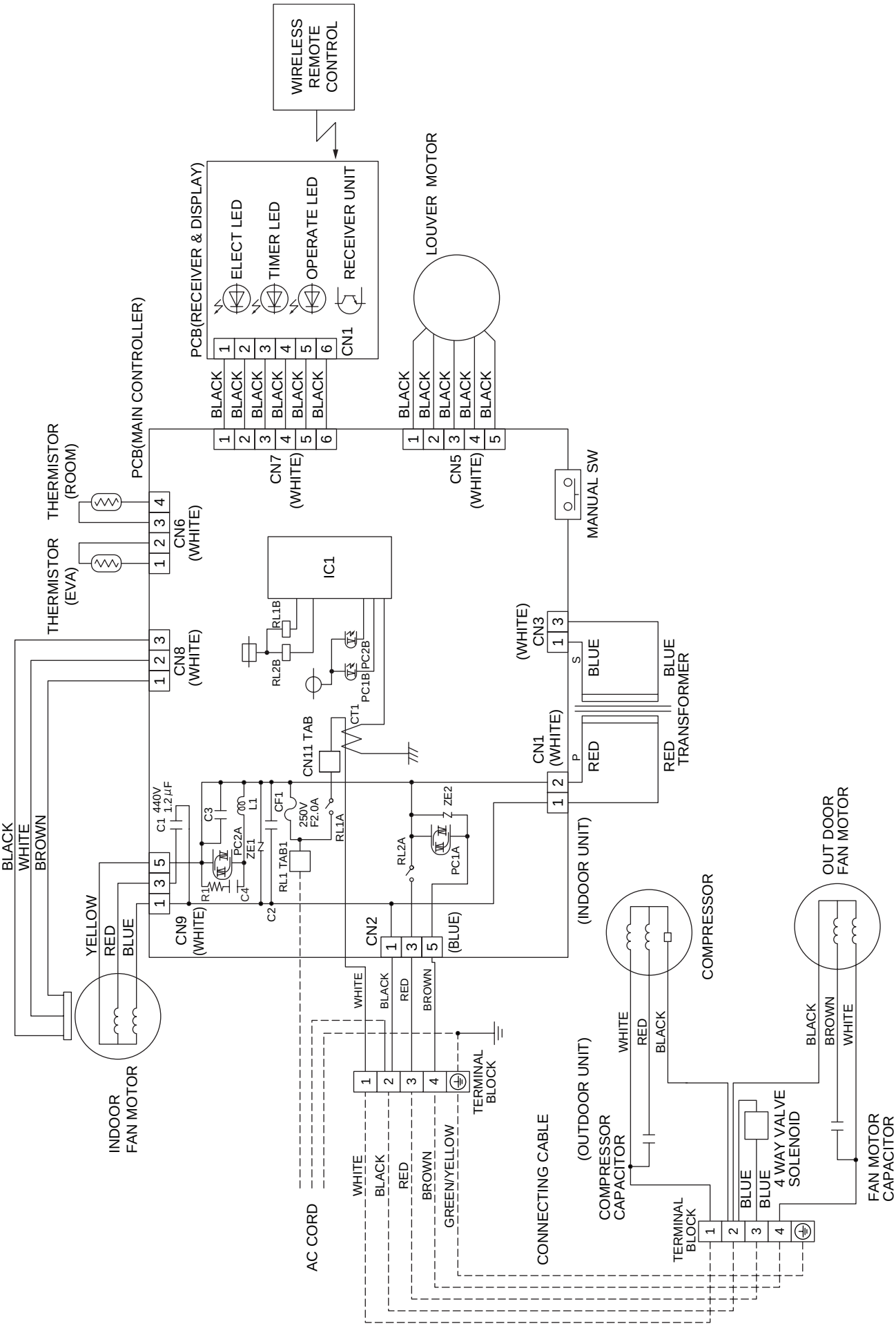
T(℃)	R(kΩ)	Voltage(V)	T(℃)	R(kΩ)	Voltage(V)
40.0	5.5	3.92	80.0	1.4	4.66
41.0	5.3	3.95	81.0	1.4	4.67
42.0	5.1	3.98	82.0	1.4	4.68
43.0	4.9	4.01	83.0	1.3	4.69
44.0	4.8	4.04	84.0	1.3	4.70
45.0	4.6	4.07	85.0	1.3	4.71
46.0	4.4	4.10	86.0	1.2	4.71
47.0	4.3	4.12	87.0	1.2	4.72
48.0	4.1	4.15	88.0	1.1	4.73
49.0	4.0	4.17	89.0	1.1	4.74
50.0	3.8	4.20	90.0	1.1	4.74
51.0	3.7	4.22	91.0	1.1	4.75
52.0	3.6	4.24	92.0	1.0	4.76
53.0	3.4	4.27	93.0	1.0	4.76
54.0	3.3	4.29	94.0	1.0	4.77
55.0	3.2	4.31	95.0	0.9	4.77
56.0	3.1	4.33	96.0	0.9	4.78
57.0	3.0	4.35	97.0	0.9	4.79
58.0	2.9	4.37	98.0	0.9	4.79
59.0	2.8	4.38	99.0	0.8	4.80
60.0	2.7	4.40	100.0	0.8	4.80
61.0	2.6	4.42	101.0	0.8	4.81
62.0	2.5	4.44	102.0	0.8	4.81
63.0	2.5	4.45	103.0	0.8	4.82
64.0	2.4	4.47	104.0	0.7	4.82
65.0	2.3	4.48	105.0	0.7	4.83
66.0	2.2	4.50	106.0	0.7	4.83
67.0	2.2	4.51	107.0	0.7	4.83
68.0	2.1	4.53	108.0	0.7	4.84
69.0	2.0	4.54	109.0	0.7	4.84
70.0	2.0	4.55	110.0	0.6	4.85
71.0	1.9	4.57	111.0	0.6	4.85
72.0	1.8	4.58	112.0	0.6	4.85
73.0	1.8	4.59	113.0	0.6	4.86
74.0	1.7	4.60	114.0	0.6	4.86
75.0	1.7	4.61	115.0	0.6	4.86
76.0	1.6	4.62	116.0	0.5	4.87
77.0	1.6	4.63	117.0	0.5	4.87
78.0	1.5	4.64	118.0	0.5	4.87
79.0	1.5	4.65	119.0	0.5	4.88
80.0	1.4	4.66	120.0	0.5	4.88

TAN/TAG-A20HW



ELECTRIC CIRCUIT DIAGRAM

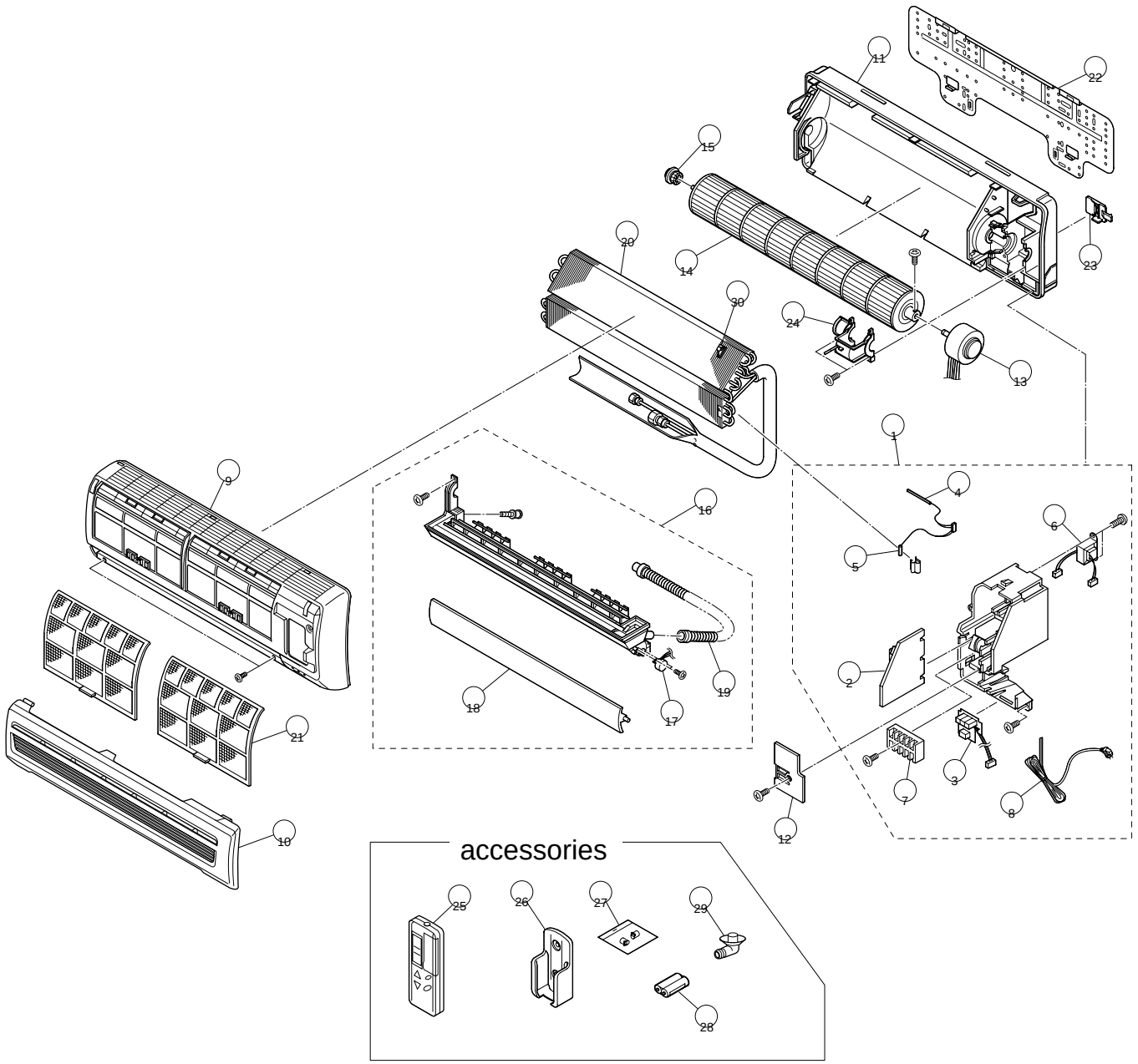
TAN/TAG-A28HW, TAN/TAG-A32HW



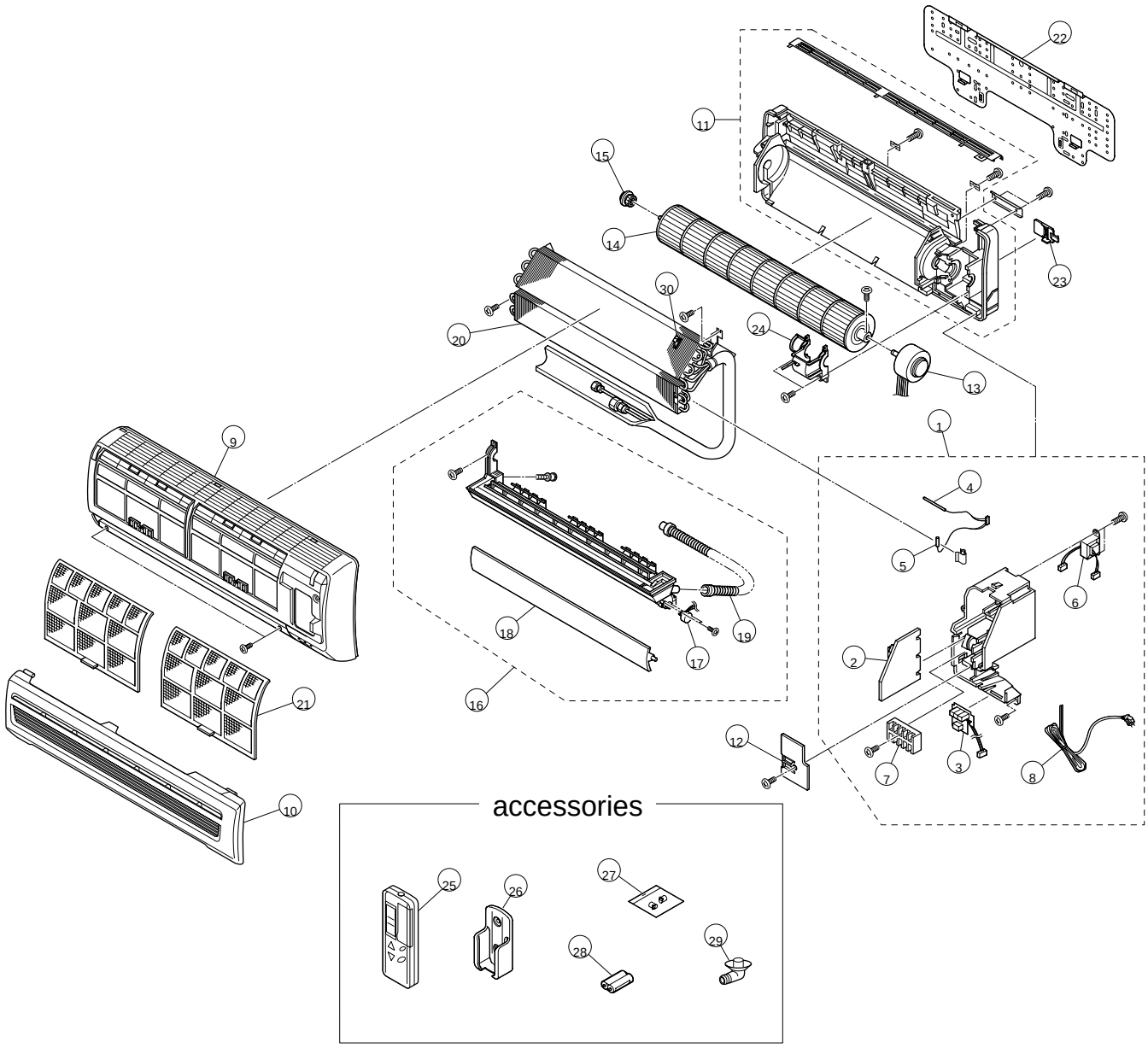
EXPLODED VIEW (INDOOR UNIT)

TAN-A20HW

TAN-A28HW

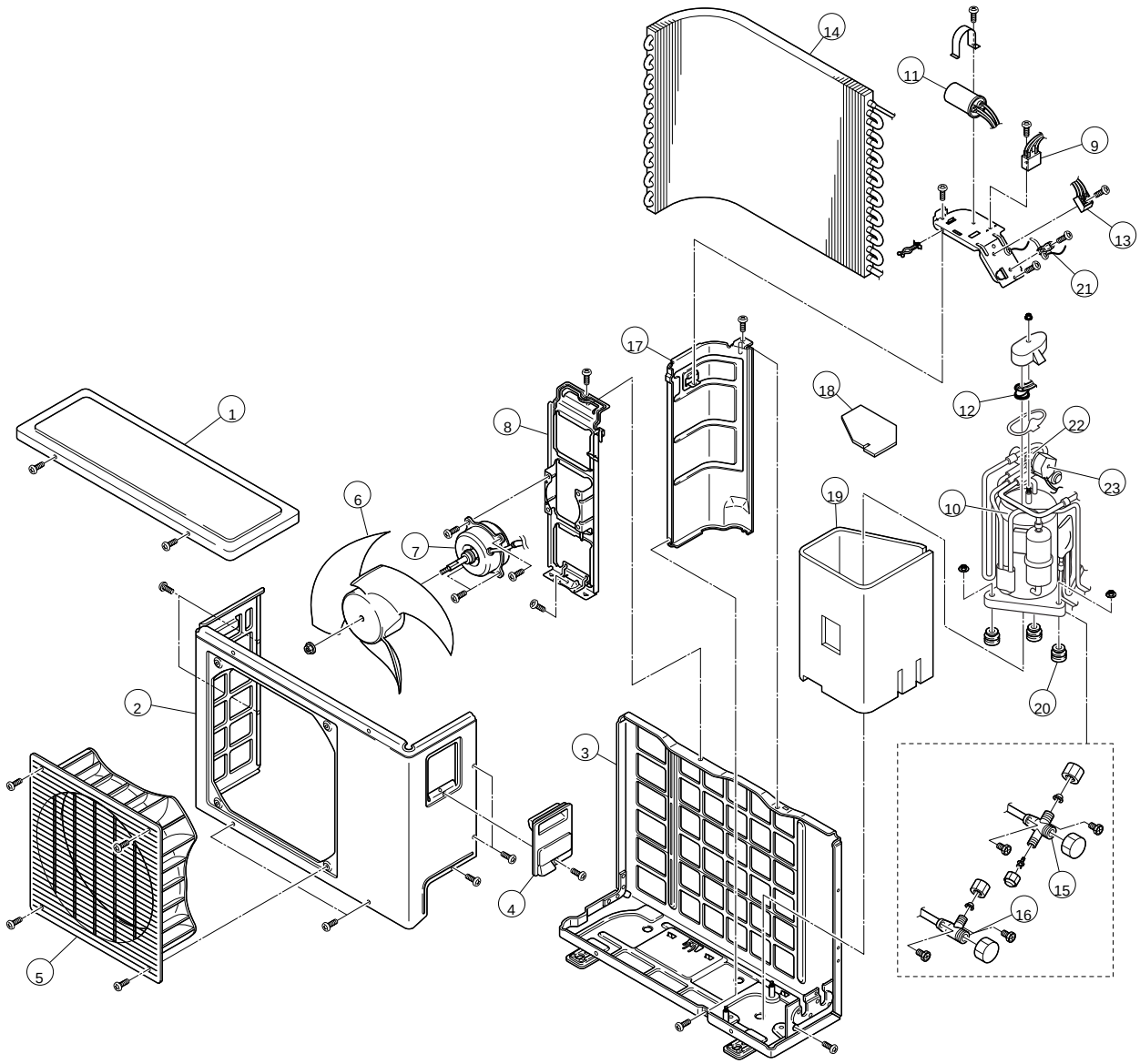


TAN-A32HW



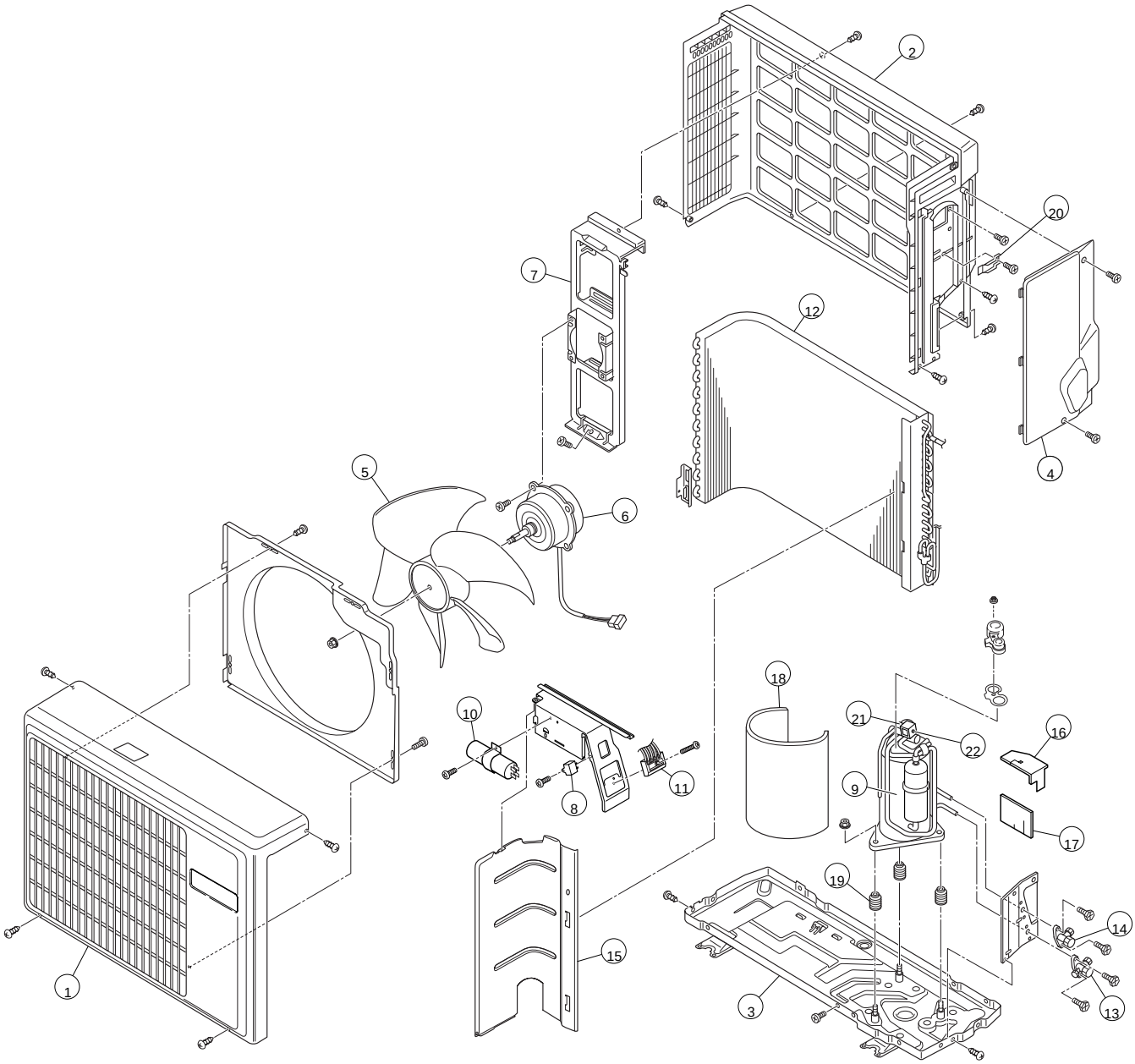
EXPLODED VIEW (OUTDOOR UNIT)

TAG-A20HW

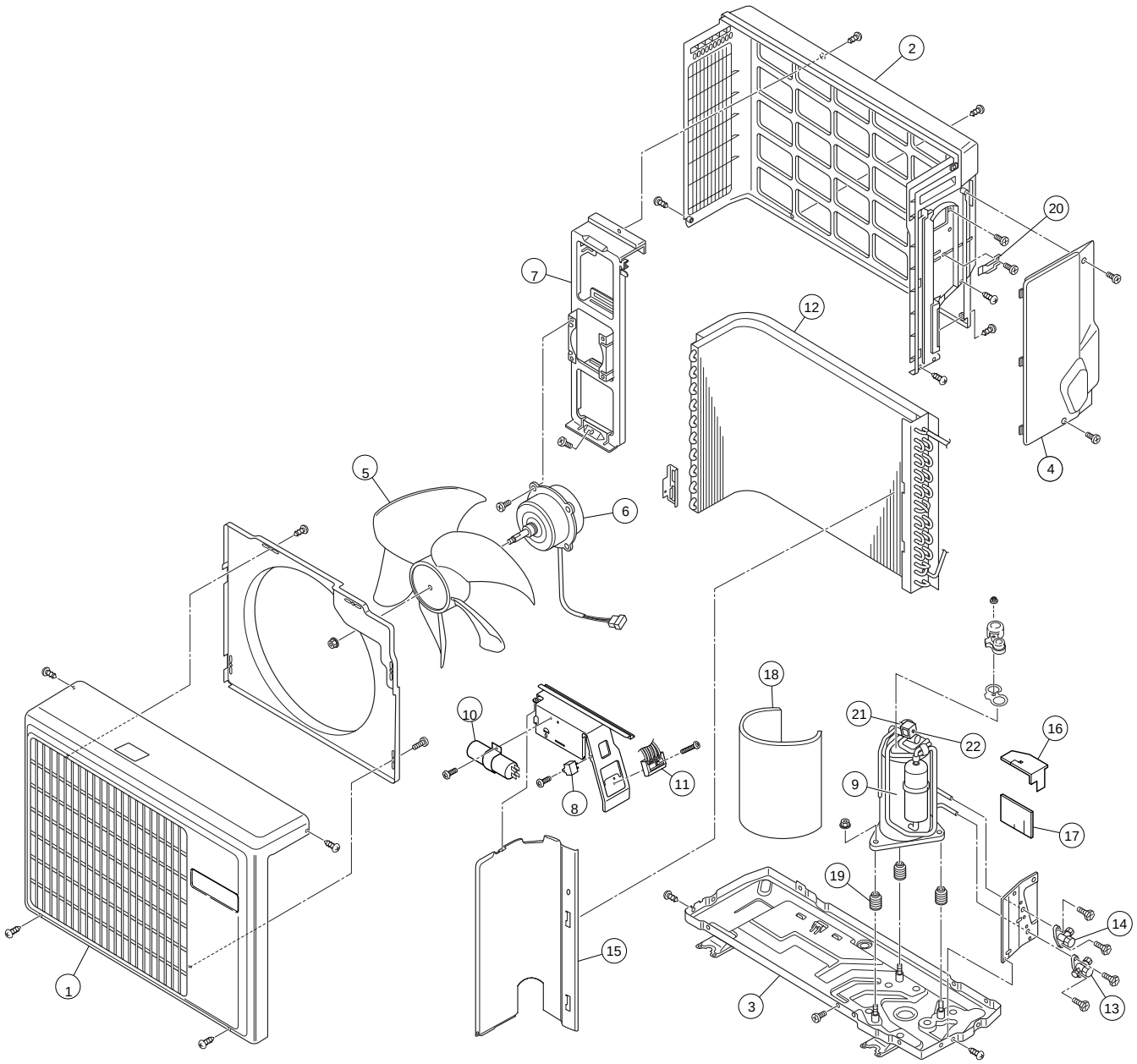


EXPLODED VIEW (OUTDOOR UNIT)

TAG-A28HW



TAG-A32HW



RA-20-[1]

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